

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

2000 Biennial Regulatory Review --)	
Streamlining and Other Revisions of)	
Part 25 of the Commission's Rules)	
Governing the Licensing of, and)	IB Docket No. 00-248
Spectrum Usage by, Satellite Network)	
Earth Stations and Space Stations)	
)	
Amendment of Part 25 of the Commission's)	
Rules and Regulations to Reduce Alien)	
Carrier Interference Between Fixed-Satellites at)	CC Docket No. 86-496
Reduced Orbital Spacings and to Revise)	
Application Procedures for Satellite)	
Communication Services)	

**FIFTH REPORT AND ORDER IN IB DOCKET NO. 00-248,
AND THIRD REPORT AND ORDER IN CC DOCKET NO. 86-496**

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By the Commission:

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I. INTRODUCTION

1. The rules adopted in this Order today will greatly facilitate the provision of broadband Internet access services, by streamlining the procedures for licensing the types of earth station antennas often used for such services.¹ Satellite-provided broadband Internet access services may provide one of the best potential options for millions of subscribers in the near term.² Promoting high speed Internet service is a goal that has been enthusiastically endorsed by the Commission.³

¹ See 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 15 FCC Rcd 25128, 25131 (para. 4) (2000) (*Notice*); 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Further Notice of Proposed Rulemaking*, IB Docket No. 00-248, 17 FCC Rcd 18585, 18588-59 (para. 4) (2002) (*Further Notice*).

² See Application of EchoStar Communications Corporation, *Hearing Designation Order*,

2. Specifically, the Commission promotes broadband provision in this Order by streamlining the earth station licensing provisions in Part 25. By streamlining Part 25, the Commission also continues to fulfill its statutory mandate under Section 11 of the Communications Act.⁴ Our primary goal in this proceeding is to streamline our review of earth station applications that, while they fail to meet the technical standards for routine processing currently in Part 25, can, because of advances in technology, be operated without causing harmful interference to adjacent satellites or terrestrial wireless operations in shared bands. In general, the rule revisions we adopt here apply to conventional C-band earth stations communicating with satellites operating in the geostationary satellite orbit (GSOs), and to conventional Ku-band earth stations communicating with both GSOs and satellites operating in non-geostationary satellite orbits (NGSOs).⁵ The rule revisions in this Order do not apply to earth stations operating in other frequency bands unless we specifically state otherwise.

3. We adopt streamlined procedures for considering non-routine earth station applications. An applicant can seek authorization for earth stations with smaller-than-routine antenna sizes under one of two procedural options to demonstrate that it will not cause adjacent satellite interference. It can either (1) reduce the power transmitted from its non-routine antenna so that it appears to be a routine earth station from the perspective of adjacent satellites; or (2) obtain certifications from the operators of the satellites with which the earth station applicant plans to communicate, showing that those satellite operators have coordinated with the operators of satellites located within six degrees of the target satellite, and that those other potentially affected satellite operators do not oppose the non-compliant operations. We also adopt a procedure for applicants seeking to operate earth stations at higher-than-routine power levels. This procedure is identical to the certification procedure for earth stations with non-routine antenna gain patterns, described above.

4. In addition to streamlining the procedures for non-routine earth station applications, we adopt several other measures to streamline or simplify the Commission's rules. We increase the satellite downlink EIRP power spectral density limit for Ku-band earth stations from 6 dBW/4kHz to 10 dBW/4kHz. We allow Ku-band temporary-fixed earth station applicants to begin operations as soon as their applications are placed on public notice. We also clarify our rules for mobile earth station terminals.

CS Docket No. 01-348, 17 FCC Rcd 20559, 20641-42 (para. 222) (2002), and sources cited therein.

³ Amendment of Part 15 Regarding New Requirements And Measurement Guidelines For Access Broadband Over Power Line Systems, *Report and Order*, ET Docket No. 04-37, 19 FCC Rcd 21265, 21271 (para. 12) (2004). See also Onsat Petition for Waiver to Permit Routine Licensing of 3.7 Meter Transmit and Receive Stations at C-Band, *Order*, 15 FCC Rcd 24488, 24488-89 (para. 2) (Int'l Bur., 2000) (*Onsat Order*), citing Extending Wireless Telecommunications Services to Tribal Lands, *Report and Order and Further Notice of Proposed Rule Making*, WT Docket No. 99-266, 15 FCC Rcd 11794 (2000); Federal-State Joint Board on Universal Service, Promoting Deployment and Subscriberhip in Unserved and Underserved Areas, Including Tribal and Insular Areas, *Report and Order*, CC Docket No. 96-45, 15 FCC Rcd 12208 (2000).

⁴ 47 U.S.C. § 161.

⁵ For purposes of this Order, the conventional C-band is the 3700-4200 MHz and 5925-6425 MHz bands. The conventional Ku-band is the 11.7-12.2 GHz and 14.0-14.5 GHz bands.

5. We also adopt several revisions to the very small aperture terminal (VSAT) rules. We relax our VSAT rules to allow multiple hub stations, and to permit temporary fixed earth stations to be used as either hub stations or remote terminals. Finally, we conclude that we can eliminate the aggregate hub earth station EIRP limit now in place for VSAT systems, and rely solely on the -14.0 dBW/4 kHz input power density limit that applies to all transmissions.

6. We expect the rules summarized above to encourage innovation, significantly reduce the filing burdens on applicants and licensees, expedite the licensing process, accelerate the provision of service to the public, and promote broadband service.

7. We adopt many of the rule revisions in this *Fifth Report and Order* while we consider more dramatic revisions to the FSS earth station licensing rules, pursuant to the *Third Further Notice of Proposed Rulemaking*, adopted concurrently with this Order.⁶ We intend those rule revisions to give earth station operators more flexibility than is possible under the rules we adopt in this *Fifth Report and Order*.

II. BACKGROUND

A. Purpose

8. The Communications Act mandates that transmitting radiocommunication facilities, such as earth stations, must be licensed before they can operate.⁷ The rules governing earth stations are contained in Part 25 of the Commission's rules.⁸ The rules are intended primarily to ensure that satellite networks can operate with a minimum of interference with respect to each other and with respect to other telecommunications services. Earth stations provide a critical link between satellites and terrestrial networks, and satellite networks depend on the Commission's earth station licensing rules to maintain an operating environment with a minimum of interference to other users operating in the band and to themselves.⁹

9. This proceeding is the latest in a series of efforts to streamline our satellite system licensing rules as much as possible without allowing harmful interference to authorized space station, earth station, or terrestrial operations. Over the years, we have taken action to streamline our satellite and earth station licensing rules and procedures when warranted.¹⁰ In addition, the

⁶ We also resolve certain issues raised in the *Notice and Further Notice in a Sixth Report and Order* adopted together with the *Third Further Notice*. See 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Sixth Report and Order and Third Further Notice of Proposed Rulemaking*, IB Docket No. 00-248, FCC 05-62 (adopted Mar. 10, 2005). We will cite this as the *Sixth Report and Order* when referring to the Report and Order portion of the document, and as the *Third Further Notice* when referring to the Notice of Proposed Rulemaking portion of the document.

⁷ 47 U.S.C. § 301.

⁸ 47 C.F.R. Part 25.

⁹ *Notice*, 15 FCC Rcd at 25130 (para. 3).

¹⁰ Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacing and to Revise Application Processing Procedures for Satellite Communications Services, *First Report and Order*, CC Docket No. 86-

International Bureau (Bureau) issued a public notice in 1999 initiating a new licensing process for certain types of earth station applications and inviting comment on a number of additional streamlining proposals.¹¹ We considered those comments when we developed our proposals for the *Notice*.¹²

10. In addition, Section 11 of the Communications Act requires that the Commission, in every even-numbered year beginning in 1998, review all regulations that apply to the operations and activities of any provider of telecommunications service and determine whether any of these regulations are no longer necessary as the result of meaningful economic competition between providers of the service.¹³ Section 11 further instructs the Commission to “repeal or modify any regulation it determines to be no longer necessary in the public interest.”¹⁴ Accordingly, in 2000, the Commission initiated a comprehensive review of telecommunications and other regulations to promote meaningful deregulation and streamlining where competition and other considerations warrant such action.¹⁵ This *Fifth Report and Order* furthers our biennial regulatory review of the commercial satellite communications industry, with a particular focus on satellite earth stations.

11. We expect that the rule changes adopted herein will expedite the provision of satellite services to the public, without increasing the risk of harmful or unacceptable interference to existing operators in any significant way. For example, we anticipate our streamlined rules will facilitate satellite Internet services to rural areas. Companies are increasingly using satellite systems to deliver Internet traffic from international points to gateway earth stations and from the public Internet along the "last mile" to earth station antennas at customers' homes, especially in rural environments. We expect our streamlining efforts here to become even more important as the number of earth station applications increases due to the delivery of new services directly to end users.

12. On a long-term basis, in the *Third Further Notice*, we consider off-axis EIRP envelope rules for FSS earth stations in the conventional C-band and Ku-band. As we explain further below, Part 25 currently establishes minimum antenna diameter requirements and maximum power levels for earth stations eligible for routine processing. While the rules adopted in this Order allow us to streamline the review of non-routine earth station applications, those rules also retain minimum antenna diameter requirements and maximum power levels. We intend the off-axis EIRP envelope to give earth station operators flexibility to decrease their power levels to compensate for smaller earth station antennas, or to use larger earth station antennas to

496, 6 FCC Rcd 2806 (1991) (*1991 Streamlining Order*); Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581 (1996) (*1996 Streamlining Order*).

¹¹ Commission Launches Earth Station Streamlining Initiative, *Public Notice*, DA 99-1259 (released June 25, 1999) (*Ku-band Auto-grant Public Notice*); Commission Launches C-Band Earth Station Streamlining Initiative, *Public Notice*, 15 FCC Rcd 24075 (2000) (*C-Band Auto-grant Public Notice*).

¹² See *Notice*, 15 FCC Rcd at 25130 (para. 3); 25155-56 (para. 85).

¹³ 47 U.S.C. § 161(a).

¹⁴ 47 U.S.C. § 161(b).

¹⁵ Federal Communications Commission Biennial Regulatory Review 2000, *Staff Report*, CC Docket No. 00-175, 15 FCC Rcd 21084 (2000) (*2000 Biennial Review Staff Report*).

compensate for higher power levels. We intend this additional flexibility to enable the Commission to increase the number of earth stations eligible for routine treatment. This, in turn, will allow the Commission to expedite its issuance of certain earth station applications considered non-routine under the rules we adopt in this Order.¹⁶

B. Procedural History

13. In response to the *Notice* issued as part of the 2000 biennial regulatory review, 13 parties filed comments, and 11 filed reply comments. In addition, the Satellite Industry Association (SIA) submitted additional proposals in late 2001. The Commission issued a *Further Notice* in 2002, requesting comment on many of the issues raised in SIA's proposals and seeking further comment on one of the issues raised in the *Notice*. In response to the *Further Notice*, five parties filed comments, and five filed replies.¹⁷ In addition, in February 2004, the International Bureau (Bureau) held a status conference with all parties who had filed comments in response to the *Notice* or *Further Notice*, in which the Bureau reviewed all the outstanding issues in this proceeding and invited the parties to supplement their pleadings again. Thus, interested parties have been given multiple opportunities to justify their proposals and to explain their positions on the issues in this proceeding. All these pleadings, as well as other *ex parte* statements addressed in this Order, and the abbreviations we use to refer to the commenters in this Order, are listed in Appendix A.¹⁸

14. The Commission has already resolved some of the issues raised in this proceeding. Among other things, it established a 15-year license term for earth station licenses,¹⁹ and eliminated the licensing requirement for receive-only earth stations receiving transmissions from non-U.S.-licensed satellites on the Permitted List.²⁰ The Commission has also adopted a

¹⁶ In the future, the Commission will also adopt a *Fourth Further Notice* in this proceeding, to invite comment on eliminating Part 23 of its rules.

¹⁷ For purposes of this Order, we refer to the comments filed in response to the *Further Notice* as "Further Comments," and the replies as "Further Replies."

¹⁸ We note that Qualcomm filed a Further Comment, a Further Reply, and several *ex parte* statements, but later withdrew its pleadings in this proceeding. See Qualcomm March 31, 2004 *Ex Parte* Statement. We find that allowing Qualcomm to withdraw its pleadings in this proceeding is in the public interest. Therefore, we will not consider further Qualcomm's pleadings in this proceeding.

¹⁹ See *Notice*, 15 FCC Rcd at 25143-44 (paras. 44-45); Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking and First Report and Order*, IB Docket Nos. 02-34 and 00-248, 17 FCC Rcd 3847, 3894-96 (paras. 139-46) (2002) (*First Report and Order*). The Commission also decided to adopt a standardized space station license application form called Schedule S, but invited comment on revisions to the form. *First Report and Order*, 17 FCC Rcd at 3875-79 (paras. 84-94).

²⁰ Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Second Report and Order*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 12507 (2003) (*Second Report and Order*). For more on the Permitted List, see Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Order*, IB Docket No. 96-111, 15 FCC Rcd 7207 (1999) (*DISCO II First Reconsideration Order*).

streamlined form for routine earth station applications, called Form 312 EZ, eliminated several outdated rules, and mandated electronic filing for all earth station filings.²¹

15. In this Order, we consider most of the remaining earth station issues raised in this proceeding. In Section III., we adopt rules to streamline the review process for earth stations that do not meet the earth station technical standards for routine processing. In Section IV., we relax certain earth station requirements. In Section V., we examine several proposals for relaxing our very small aperture terminal (VSAT) rules. In Section VI., we consider other miscellaneous streamlining issues. Section VII. is a conclusion.²² The rule revisions adopted in Section III. will remain in effect while the rule revisions proposed in the *Third Further Notice* are under consideration. The rest of the rules adopted in this Order will remain in effect on a long-term basis.

16. In the *Notice* and *Further Notice*, the Commission invited comment on antenna gain pattern issues,²³ and issues related to contention protocols in VSAT networks.²⁴ Because those issues are interrelated with the off-axis EIRP issues we plan to consider in the *Third Further Notice*, we will address those issues in the *Sixth Report and Order* together with that NPRM. We also defer other issues to the *Third Further Notice* in cases where commenters propose rule revisions that are beyond the scope of the *Notice* and *Further Notice*.²⁵

²¹ Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Third Report and Order and Second Further Notice of Proposed Rulemaking*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 13486 (2003) (*Third Report and Order*); Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Fourth Report and Order*, IB Docket Nos. 02-34 and 00-248, 19 FCC Rcd 7419 (2004) (*Fourth Report and Order*).

²² In addition to the *Notice* and the *Further Notice*, the Commission adopted a *Second Further Notice* together with the *Third Report and Order*, to address certain mandatory electronic filing issues. Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Third Report and Order and Second Further Notice of Proposed Rulemaking*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 13486, 13514-15 (paras. 83-85) (2003) (*Second Further Notice*). Those issues were resolved in the *Fourth Report and Order*, 19 FCC Rcd at 7421-22 (paras. 3-6).

²³ *Further Notice*, 17 FCC Rcd at 18599-18613 (paras. 29-73).

²⁴ *Notice*, 15 FCC Rcd at 25146-47 (paras. 54-56); *Further Notice*, 17 FCC Rcd at 18620-21 (paras. 92-95).

²⁵ See also Hughes Comments at 11-12; PanAmSat Comments at 4; Spacenet Reply at 7-8 (proposing adoption of an off-axis EIRP envelope). We will also address these comments in the *Third Further Notice*.

III. NON-ROUTINE EARTH STATION APPLICATIONS

A. Background

1. Routine Earth Station Licensing Standards

17. The Commission licensed the first commercial C-band satellites in 1973,²⁶ and the first Ku-band satellites in 1981.²⁷ As the satellite industry developed, the Commission, in 1983, established a 2° orbital spacing policy to maximize the number of in-orbit satellites operating in either the conventional C-band or the Ku-band.²⁸ At that time, the Commission began assigning adjacent in-orbit satellites to orbit locations 2° apart in longitude, rather than the 3° to 4° previously used. The Commission also established technical rules to govern earth stations communicating with satellites at 2° orbital separations to ensure that their operations do not cause unacceptable interference to adjacent satellite systems. These requirements, which are codified in Part 25 of our rules, include earth station antenna diameter and performance requirements and power restrictions.²⁹ We "routinely" license earth station facilities that meet these technical requirements, without conducting a further technical review to verify that the earth station will not cause unacceptable interference into other satellite systems.³⁰

²⁶ Notice, 15 FCC Rcd at 25132 (para. 7), citing Western Union Telegraph Company, *Order and Authorization*, 38 FCC 2d 1197 (1973); Communications Satellite Corporation, *Memorandum Opinion, Order and Authorization*, 42 FCC 2d 677 (1973).

²⁷ Notice, 15 FCC Rcd at 25132 (para. 7), citing Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, *Memorandum Opinion and Order*, 84 FCC 2d 584, 606 (para. 56) (1981).

²⁸ Notice, 15 FCC Rcd at 25132 (para. 7), citing Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, FCC 83-184, 54 Rad. Reg. 2d 577 (released Aug. 16, 1983), *summary printed in* Licensing Space Stations in the Domestic Fixed-Satellite Service, 48 F.R. 40233 (Sept. 6, 1983) (*Two Degree Spacing Order*). See also Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, 99 FCC 2d 737 (1985) (*Two Degree Spacing Reconsideration Order*).

²⁹ 47 C.F.R. §§ 25.134, 25.209, 25.211, 25.212. See also Routine Licensing of Earth Station in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, respectively, for Both Full Transponder and Narrowband Transmissions, *Declaratory Order*, 2 FCC Rcd 2149 (Com. Car. Bur., 1987), cited in 47 C.F.R. § 25.134.

³⁰ Notice, 15 FCC Rcd at 25132 (para. 7), citing 47 C.F.R. Part 25. For purposes of this Order, we define "routine" earth stations as those that can be licensed without a case-by-case review. In the past, on occasion, the Commission has also used the term "routine" earth station application to mean an application for an ALSAT earth station license in the conventional C-band and Ku-band. In this Order below, however, we adopt a procedure that will enable us to issue an ALSAT earth station license, even though that application required a case-by-case technical review. That procedure requires licensees to lower their off-axis EIRP power levels. See Section III.D. Moreover, we note that many of the Part 25 technical requirements are applicable to FSS earth stations other than the conventional C-band and Ku-band, where the ALSAT designation is not applicable.

"ALSAT" means "all U.S.-licensed space stations." Originally, under an ALSAT earth station license, an earth station operator providing fixed-satellite service in the conventional C- and Ku-bands could access any U.S. satellite without additional Commission action, provided that those communications are in accordance with the same technical parameters and conditions established in the earth stations' licenses. See Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space

18. In the *Notice*, the Commission explained that it is possible in some cases for an earth station that does not meet all of the technical standards of Part 25 to operate without causing unacceptable interference in a 2° orbital spacing environment.³¹ The Commission explained further that it conducts a case-by-case review of each of these "non-routine" earth stations to determine whether the application can be granted.³² Currently, this review requires the applicant to submit a technical study demonstrating that the proposed earth station will not cause unacceptable interference to 2°-complaint operations.³³ Under the current rules, the preferred form of this technical study is the Adjacent Satellite Interference Analysis (ASIA) program as described in Section 25.134(b).³⁴ This analysis is often difficult and time consuming to perform, because the information needed for the analysis is not readily available from any one source, and the ASIA results can be subject to interpretation.³⁵ Some of the data needed for ASIA are available only from individual satellite operators.³⁶ Further, the operation of the non-compliant earth station antenna must still be coordinated with adjacent satellite operations.³⁷

Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, 15 FCC Rcd 7207, 7210-11 (para. 6) (1999) (*DISCO II First Reconsideration Order*). The *DISCO II First Reconsideration Order* expanded ALSAT earth station licenses to allow access to any satellite on the Permitted List. *DISCO II First Reconsideration Order*, 15 FCC Rcd at 7215-16 (para. 19).

³¹ *Notice*, 15 FCC Rcd at 25132 (para. 7).

³² *Notice*, 15 FCC Rcd at 25132 (para. 7).

³³ *Notice*, 15 FCC Rcd at 25134 (para. 13), *citing* 47 C.F.R. § 25.209(f).

³⁴ *Notice*, 15 FCC Rcd at 25134 (para. 13), *citing* 47 C.F.R. § 25.134(b). Concurrently with the *Two Degree Spacing Reconsideration Order*, the Commission formed an Advisory Committee to obtain technical and operational expertise in implementing Two Degree Spacing standards. Establishment of an Advisory Committee on Implementation of Reduced Orbit Spacing Between Domestic Fixed Satellites, *Order*, 102 FCC 2d 390 (1985). Among the Advisory Committee's recommendations was to adopt ASIA as the generally accepted procedure for calculating adjacent satellite interference. The Commission confirmed this determination in 1996, but also decided to permit licensees and applicants to use their own interference analysis programs, provided that the program is made available to the Commission and the public for review. *1996 Streamlining Order*, 11 FCC Rcd at 21601-02 (para. 50).

³⁵ Conducting an interference assessment using the ASIA program requires the collection of very specific modulation and link budget parameters for all of the communication links being analyzed. Parameters such as modulation indices, baseband frequencies, data and error correction coding rates, noise temperatures, antenna gains, powers, and sometimes carrier frequency plans are required for the interfering and desired communication links. Once these parameters are collected, the ASIA computer program computes carrier-to-interference (C/I) ratios between the desired and interfering links. Such detailed parameters are not collected in the earth station licensing process and are generally available only from the individual satellite system operators. *See Notice*, 15 FCC Rcd at 25134 (para. 13).

³⁶ *Notice*, 15 FCC Rcd at 25134 n.24.

³⁷ *See Notice*, 15 FCC Rcd at 25134 (para. 13).

2. Proposed Non-Routine Earth Station Procedures

19. The current procedure for non-routine earth stations often delays the introduction of new services and technological innovation to the public, including broadband Internet access services.³⁸ In addition, there are strong economic and other incentives to use the smallest possible aperture earth station antenna, in that smaller antennas are less expensive to manufacture, and it is easier to find suitable locations to install smaller antennas.³⁹ Therefore, the Commission proposed streamlined procedures for non-routine earth stations.

20. The *Notice* invited comment on streamlined processing for two types of non-routine earth station applications: (1) those seeking authority to operate an earth station with an antenna diameter too small to meet the routine processing standards of Part 25;⁴⁰ and (2) those seeking authority to operate an earth station at a power level greater than those specified in Part 25.⁴¹ For applications seeking authority to use a small antenna, the Commission proposed two alternative procedures. One procedure would allow the Commission to require the applicant proposing a small antenna to operate at a lower power level to compensate for the smaller antenna diameter.⁴² The second procedure, as proposed by the Commission in the *Notice*, would allow applicants to submit affidavits from target satellite operators, verifying that the operation of the small earth station antenna has been coordinated with other satellite operators potentially affected by the proposed non-routine earth station.⁴³ For applications to operate at non-routine power levels, the Commission proposed only one option, an affidavit procedure. This procedure would be substantially similar to the affidavit procedure now being used for applications proposing non-routine earth station antenna diameters.⁴⁴ Finally, the Commission proposed codifying these procedures in Section 25.220 of its rules.⁴⁵

³⁸ *Notice*, 15 FCC Rcd at 25134 (para. 13).

³⁹ *See Notice*, 15 FCC Rcd at 25134 (para. 12) (noting that there are strong economic incentives in favor of smaller earth station antennas.)

⁴⁰ The smallest diameter antenna routinely licensed at C-band is 4.5 meters, and the smallest antenna routinely licensed at Ku-band is 1.2 meters in diameter. *See Notice*, 15 FCC Rcd at 25133 (para. 11). The size of the earth station antenna is important since, in general, smaller antennas produce wider transmission beams, which, in turn, can create more potential interference to adjacent satellite operations. *Notice*, 15 FCC Rcd at 25132 (para. 7).

⁴¹ *See* 47 C.F.R. §§ 25.134 (VSAT networks), 25.211 (video transmissions), 25.212 (narrowband transmissions); *Notice*, 15 FCC Rcd at 25140 (para. 31).

⁴² As explained further below, reducing the diameter of an earth station antenna increases the side lobes. Reducing the transmit power of the earth station reduces the side lobes, however, and so can compensate for the reduction in antenna diameter. *See* Section III.D. below. *See also Notice*, 15 FCC Rcd at 25135-36 (paras. 15-19).

⁴³ *Notice*, 15 FCC Rcd at 25136-37 (paras. 20-24).

⁴⁴ *Notice*, 15 FCC Rcd at 25140-41 (paras. 31-33).

⁴⁵ *Notice*, 15 FCC Rcd at 25187-88 (App. B).

21. In its 2001 *ex parte* statements, SIA disagreed with several of these proposals. First, SIA would only permit operators in the 5925-6425 MHz band to compensate for smaller-than-routine antennas by reducing their power levels.⁴⁶ In addition, SIA would require target satellite operators to coordinate non-routine earth station operations with adjacent satellite operators, regardless of whether the earth station operator planned to lower its power level.⁴⁷ SIA also recommended requiring non-routine earth station applicants to submit certifications from all satellite operators within 3° of the target satellite operator to show that coordination is complete, instead of one certification from the target satellite operator.⁴⁸ Finally, SIA proposed establishing different standards for (1) routine processing for receive-only earth stations or the receive operations of non-routine transmit/receive earth stations, and (2) protecting such receive earth station operations from interference.⁴⁹ SIA's proposed standards for non-routine receive-only earth stations varied depending on antenna size and whether the applicant requested ALSAT authority.⁵⁰ SIA initially opposed adopting a streamlined procedure for non-routine receive-only earth stations or the receive operations of non-routine transmit/receive earth stations.⁵¹

22. The Commission invited comment on SIA's proposal, but also pointed out several areas of concern. First, the Commission found that SIA's proposal to restrict earth station operators' ability to lower their power levels was inconsistent with some of SIA's other proposals.⁵² The Commission also found that SIA did not adequately explain why this restriction might be necessary to prevent "substandard" antennas.⁵³ The Commission observed that SIA's proposal to impose a coordination procedure on earth station operators planning to reduce their power levels might be unreasonably burdensome for earth station applicants.⁵⁴ Finally, the Commission noted that the differing standards for transmit and receive operations was confusing.⁵⁵ The Commission invited SIA and other interested parties to address these concerns.⁵⁶

⁴⁶ *Further Notice*, 17 FCC Rcd at 18630 (para. 124), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28.

⁴⁷ *Further Notice*, 17 FCC Rcd at 18630 (para. 124), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28.

⁴⁸ *Further Notice*, 17 FCC Rcd at 18630 (para. 125), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28. *See also* SIA December 10 *Ex Parte* Statement, App. at 19-20 (SIA's proposed Section 25.220(c)).

⁴⁹ *See Further Notice*, 17 FCC Rcd at 18631 (para. 126). *See also* SIA December 10 *Ex Parte* Statement at 28, and App. at 13.

⁵⁰ SIA December 10 *Ex Parte* Statement, App. at 13.

⁵¹ SIA December 10 *Ex Parte* Statement at 28.

⁵² *Further Notice*, 17 FCC Rcd at 18631 (para. 127).

⁵³ *Further Notice*, 17 FCC Rcd at 18631-32 (para. 128).

⁵⁴ *Further Notice*, 17 FCC Rcd at 18632 (para. 129).

⁵⁵ *Further Notice*, 17 FCC Rcd at 18632-33 (paras. 130-31).

⁵⁶ *Further Notice*, 17 FCC Rcd at 18633 (para. 132).

23. In its further comments, SIA revised parts of its proposal. First, SIA would allow both conventional C-band and conventional Ku-band earth station applicants to lower their power levels as a means of compensating for smaller-than-routine earth station antennas, provided that the earth station operations are coordinated.⁵⁷ SIA further recommends re-defining "non-routine" as exceeding the antenna gain pattern envelope in Section 25.209, rather than on the basis of antenna size.⁵⁸ However, SIA continues to recommend determining whether an earth station is routine based only on the antenna gain pattern for its transmit operations, and repeats its original proposal to protect transmit/receive antennas from interference only to the extent that an antenna consistent with the requirements of Section 25.209(a) would not receive interference.⁵⁹ SIA would also process all receive-only earth stations routinely, because they cannot cause interference.⁶⁰

24. SIA continues to oppose allowing earth station operators to lower their power levels without also coordinating with adjacent satellites, however.⁶¹ SIA would also still require that the target satellite operator negotiate coordination agreements on behalf of the earth station operators. SIA further explains that the coordination agreements themselves should be attached to the earth station license application.⁶²

B. General Framework

25. *Background.* Andrew Corporation, Astrolink, and Hughes support the Commission's general approach for processing non-routine earth stations.⁶³ SIA maintains that the current

⁵⁷ SIA Further Comments at 24.

⁵⁸ SIA Further Comments at 24.

⁵⁹ SIA Further Comments at 23, *citing* 47 C.F.R. § 25.209(c); SIA February 1, 2005 *Ex Parte* Statement at Att.

⁶⁰ SIA Further Comments at 23, *citing* 47 C.F.R. § 25.209(c).

⁶¹ SIA Further Comments at 23; SIA March 23, 2004 *Ex Parte* Statement at 3; SIA February 1, 2005 *Ex Parte* Statement at Att.

⁶² SIA Further Comments at 23. In this proceeding, we have directed our attention to SIA's proposals for non-routine earth station applications. In addition, SIA made several proposals with respect to routine earth stations, including proposed rule revisions intended to increase the number of earth stations considered routine. Many of SIA's proposals involved the antenna gain pattern requirements in Section 25.209, and many proposals included revised application information requirements. For example, SIA advocates treating Ku-band earth stations routinely if the antenna gain pattern intersects the antenna gain pattern envelope between 1.5° and 1.8° off-axis, and non-routine either (1) provides SIA's proposed antenna pointing accuracy demonstration discussed above, or (2) coordinates its operations with adjacent satellite operators. SIA Further Comments at 23. The Commission addresses this proposal together with other antenna gain pattern issues in the *Sixth Report and Order*.

⁶³ Andrew Corporation Comments at 1-3; Astrolink Comments at 3-4; Hughes Reply at 2. These parties recommend slight modifications to the proposed procedures. We address these recommendations below.

procedure is very burdensome.⁶⁴ Astrolink, however, argues that the proposed procedures should not be applied to Ka-band earth stations because Section 25.138 of the Commission's rules already contains similar requirements for Ka-band earth stations.⁶⁵ Andrew Corporation states that Section 25.220, which is intended to codify the new procedures, might be easier to understand if it addressed transmit and receive stations separately.⁶⁶ In contrast, Spacenet asserts that the Commission's proposed procedures are more burdensome than the current procedure, and so might limit development of broadband services to rural areas.⁶⁷

26. In support of its revised proposal, SIA argues that routine processing should be based only on the antenna gain pattern of the transmit operations of an earth station antenna, regardless of the receive operations of that antenna.⁶⁸ SIA claims that continuing to base eligibility for routine processing on both transmit and receive antenna gain patterns would substantially undercut the benefits of starting the antenna gain pattern envelope at a greater off-axis angle. This is because, according to SIA, basing the routine determination on the receive pattern of a 0.74-meter-equivalent antenna would disqualify that antenna from routine treatment.⁶⁹ SIA also repeats its concern that allowing earth stations to reduce their power levels, absent coordination, might cause "underperforming" antennas to proliferate.⁷⁰ SIA does not provide any further explanation for its proposal.

27. Spacenet opposes SIA's proposal because it is so complex as to defeat the purpose of streamlining the procedure for non-routine earth stations.⁷¹ Spacenet is also concerned that SIA's proposal would increase the burdens of coordination for earth station operators.⁷² Similarly, Aloha Networks points out that SIA's procedure would impose unnecessary burdens on VSAT

⁶⁴ SIA November 5, 2001 *Ex Parte* Statement, Att. 2 at 1.

⁶⁵ Astrolink Comments at 3-4.

⁶⁶ Andrew Corporation Comments at 3.

⁶⁷ Spacenet Comments at 5-10.

⁶⁸ SIA Further Comments at 8-9.

⁶⁹ SIA Further Comments at 9.

⁷⁰ SIA Further Comments at 23. *See also* SIA March 23, 2004 *Ex Parte* Statement at 3.

⁷¹ Spacenet Further Comments at 20.

⁷² Spacenet Further Comments at 20. *See also* Boeing April 14, 2004 *Ex Parte* Statement; Boeing April 19, 2004 *Ex Parte* Statement (supporting a procedure for Earth Stations on Vessels (ESVs) and Aeronautical Mobile Satellite Service (AMSS) earth stations similar to the power reduction procedure we adopt below, and arguing that SIA's proposal would be "inappropriate" for these services). The Commission adopted procedures for ESVs recently in another Order. Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Report and Order*, IB Docket No. 02-10, FCC 04-286 (released Jan. 6, 2005) (*ESV Order*). The Commission is also considering rules for AMSS earth stations in another proceeding. Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service, *Notice of Proposed Rulemaking*, IB Docket No. 05-20, FCC 05-14 (released Feb. 9, 2005) (*AMSS NPRM*).

applicants by requiring coordination for non-conforming antennas regardless of the transmit power density level.⁷³

28. *Discussion.* We adopt our proposed streamlined procedure for non-routine earth station applications, with minor revisions. We disagree with Spacenet that the procedures for non-routine earth station applications proposed in the *Notice* are more burdensome than the current procedures. As explained in the *Notice*, it is often difficult and time consuming to prepare the ASIA.⁷⁴ Accordingly, we adopt our proposal to replace the current ASIA requirement for non-routine earth station license applications with a procedure that allows applicants to choose between (1) operating at reduced power levels, and (2) obtaining certifications from target satellite operators showing that the non-routine earth station has been coordinated with potentially affected satellite operators. In Appendix D to this Order, we provide a step-by-step outline of the certification procedure we adopt here. Below, we address specific issues raised by implementation of these procedures.

29. We agree with Astrolink that the procedures in Section 25.138 are sufficient for Ka-band earth stations.⁷⁵ No other commenter supported Andrew Corporation's suggested revisions to Section 25.220, to have transmit and receive operations addressed separately, nor do we see how such revisions would make the rule easier to understand. Section 25.220 specifies the streamlined procedures available to non-routine earth station applicants, and the authority available under each procedure.

30. Finally, we conclude that the procedure we adopt here is preferable to the non-routine earth station procedures that SIA proposed in its *ex parte* statements and its Further Comments. As an initial matter, we agree with Spacenet that SIA's proposals are unduly complex, and would increase the burdens of coordination for earth station operators.⁷⁶ SIA would distinguish between routine and non-routine earth stations based on whether their antennas meet the antenna gain pattern envelope.⁷⁷ The purpose of distinguishing between routine and non-routine earth station antennas is to identify a class of earth stations that can be licensed without a case-by-case engineering review.⁷⁸ SIA's approach would compel the Commission to conduct a case-by-case engineering review simply to determine whether to treat an earth station application routinely. The Commission has explained in the past that introducing an unnecessarily complex

⁷³ Aloha Networks May 12, 2004 *Ex Parte* Statement at 1.

⁷⁴ *Notice*, 15 FCC Rcd at 25134 (para. 13).

⁷⁵ Section 25.138 was adopted in Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, *Report and Order*, IB Docket No. 98-172, 15 FCC Rcd 13430 (2000) (*18 GHz Band Report and Order*).

⁷⁶ Spacenet Further Comments at 20.

⁷⁷ SIA Further Comments at 24.

⁷⁸ *Notice*, 15 FCC Rcd at 25132 (para. 7); *Further Notice*, 17 FCC Rcd at 18587-88 (para. 3).

categorization into Commission procedures can frustrate the public interest by requiring more time to fit each application into its proper category.⁷⁹

31. In addition, other than clarifying and explaining its proposal to treat an earth station's transmit operations differently from its receive operations, SIA has not addressed many of the concerns the Commission raised in the *Further Notice*.⁸⁰ In particular, SIA does not explain why an antenna with a smaller-than-routine diameter is necessarily substandard, or how it expects its proposed coordination procedure would affect the proliferation of substandard antennas.

32. In response to SIA's recommendation to protect transmit/receive antennas from interference only to the extent that an antenna consistent with the requirements of Section 25.209(a) would not be expected to receive interference,⁸¹ we observe that this is what is required in the Commission's rules now.⁸² We will not adopt SIA's recommendation to refrain from applying routine standards to receive-only earth stations, and the receive operations of transmit/receive earth stations, however.⁸³ Recently, in the *Second Space Station Reform Order*, the Commission made it clear that routine licensing standards apply to receive-only earth stations just as much as transmit/receive earth stations.⁸⁴ The Commission relied on this requirement in determining how much it could eliminate its licensing requirement for receive-only earth stations receiving transmissions from non-U.S.-licensed satellites on the Permitted List, but only for routine receive-only earth stations.⁸⁵ SIA does not persuade us to revisit these issues.

⁷⁹ *Third Report and Order*, 18 FCC Rcd at 13513 (para. 77). *See also Further Notice*, 17 FCC Rcd at 18609 (para. 59) (noting that SIA's proposals might be unnecessarily complex.)

⁸⁰ *See Further Notice*, 17 FCC Rcd at 18631-32 (paras. 127-29) (discussion of Commission concerns regarding SIA's 2001 *ex parte* proposals).

⁸¹ SIA Further Comments at 23.

⁸² 47 C.F.R. § 25.209(c).

⁸³ SIA Further Comments at 23.

⁸⁴ Amendment of the Commission's Space Station Licensing Rules and Policies, *Second Report and Order*, IB Docket No. 02-34, 18 FCC Rcd 12507, 12517 (para. 22) (2003), *citing* Televisa International, LLC, *Order and Authorization*, 13 FCC Rcd 10074 (Int'l Bur., 1997) (*Televisa Order*). The *Televisa Order* explains that non-routine receive-only earth stations may be susceptible to harmful interference in a two-degree-spacing environment, and conditioned a blanket license for non-routine receive-only earth stations on a requirement to label the earth stations to warn customers that the Commission cannot protect those earth stations from harmful interference.

⁸⁵ Most receive-only earth stations are not required to be licensed at all. *See Regulation of Domestic Receive-Only Satellite Earth Stations, First Report and Order*, CC Docket No. 78-374, 74 FCC 2d 205 (1979) (*Receive-Only Earth Station Permissive Licensing Order*); *1991 Streamlining Order*, 6 FCC Rcd at 2807 (para. 7). In 1997, the Commission required some receive-only earth stations to be licensed, those that receive transmissions from non-U.S.-licensed space stations, to maintain jurisdiction over the space station's operations in the United States. Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, 12 FCC Rcd 24094, 24179-80 (para. 201) (1997) (*DISCO II*). The Commission relaxed this receive-only earth station licensing requirement in the *Second Space Station Reform Order*, and now allows unlicensed routine receive-only earth stations to receive transmissions in the conventional C-band and Ku-band from non-U.S.-licensed space stations on the Permitted List. *Second Space Station Reform Order*, 18 FCC Rcd at 12516-17 (paras. 20-22).

Accordingly, we will continue to treat the receive operations of non-routine earth stations as we have in the past. Such earth stations will be protected from harmful interference only to the extent that routine earth stations are protected,⁸⁶ and may be conditioned on the licensee warning its customers about the potential for harmful interference.⁸⁷

33. We are confident that lowering the transmit power of non-routine earth stations, without coordination, is sufficient to protect adjacent satellite operators and terrestrial wireless licensees from harmful interference. The Commission will review all such earth station applications to determine whether the power has been lowered sufficiently, and will prohibit earth station licensees from operating in excess of that power level by putting a condition in the license. Thus, to the extent that SIA is concerned that an earth station operator may nevertheless increase its power levels after we grant its license, such operation would violate that license condition and could lead to a forfeiture penalty. We do not anticipate many such forfeitures, however, because it has been the Commission's experience that earth station operators generally comply with the terms of their licenses, and that forfeiture penalties are therefore unnecessary.

34. In summary, we conclude that adoption of the streamlined non-routine earth station procedure proposed in the *Notice* would reduce administrative burdens on non-routine earth station applicants, and facilitate Internet service to rural and unserved areas, without unreasonably increasing the risk of harmful interference to adjacent satellite systems. Below, we address pleadings addressing specific issues with respect to the streamlined non-routine earth station procedure we adopt here.

C. Non-Routine Antenna Size

1. Background

35. As we recognized in the *Notice*, there are strong economic and other incentives to use the smallest possible aperture earth station antenna.⁸⁸ Allowing an antenna to operate with side lobes in excess of the Section 25.209 envelope, without making some other adjustment such as reducing input power spectral density levels, creates a potential for unacceptable interference to adjacent satellite systems.⁸⁹ Accordingly, we invited comment on two alternatives to the ASIA requirement for reviewing applications proposing earth stations with non-routine diameters: (1) power reductions, and (2) affidavits demonstrating coordination with affected adjacent satellite operations. We discuss both these proposals below.

⁸⁶ 47 C.F.R. § 25.209(c).

⁸⁷ *See Televisa Order*, 13 FCC Rcd 10074.

⁸⁸ Smaller antennas are less expensive to manufacture, and it is easier to find suitable locations to install smaller antennas. In addition, improvements of transmitter and receiver technology on board satellites have enabled satellite communications systems to decrease earth station antenna diameters without affecting service performance. *Notice*, 15 FCC Rcd at 25134 (para. 12).

⁸⁹ *Notice*, 15 FCC Rcd at 25133 (para. 10).

2. Power Reductions

36. *Background.* In the *Notice*, the Commission explained that reducing the transmitted power of a non-routine diameter earth station can reduce the side lobe energy to levels that fall within the levels that would be produced if the maximum allowable power level were transmitted by an antenna that complies with the antenna gain pattern envelope in Sections 25.209(a) and (b).⁹⁰ Accordingly, the Commission proposed to implement an equivalent isotropically radiated power (EIRP) density versus off-axis angle criterion beginning at 1° off-axis.⁹¹ In this way, the off-axis EIRP density would be maintained at a level equivalent to that provided by routine earth stations at 2° and beyond.⁹² The Commission stated that it would continue to process these earth station applications on a case-by-case basis, but that this procedure would enable it to process those applications more rapidly.⁹³

37. While a power reduction by itself should be sufficient to prevent the non-routine diameter earth station from causing interference to other satellite systems, it would not affect the potential for other satellite systems to cause interference into the non-routine earth station.⁹⁴ Therefore, the Commission tentatively concluded in the *Notice* that non-routine earth stations taking advantage of the option to lower their power should not be granted protection from interference from other satellite systems, unless they also obtain the affidavits discussed below.⁹⁵ It also proposed that non-routine sized earth stations reducing their power should be eligible for ALSAT earth station licenses for transmit-only operations and for transmit/receive operations where the earth station operator does not request any protection from adjacent satellite interference to its receive operations.⁹⁶

38. *Discussion.* GE Americom finds this approach reasonable, provided that the operator of the satellite with which the non-routine earth station is operating monitors the reduced power level, and that the earth station must accept the same level of interference that a routine earth station must tolerate.⁹⁷ Loral notes that the Commission has adopted this approach on a case-by-case basis with no harmful effects.⁹⁸ Onsat supports this power reduction proposal as an alternative to the affidavit procedure because it has found difficulty in obtaining affidavits from other satellite operators in the past.⁹⁹

⁹⁰ *Notice*, 15 FCC Rcd at 25135 (para. 15).

⁹¹ *Notice*, 15 FCC Rcd at 25135 (para. 15).

⁹² *Notice*, 15 FCC Rcd at 25135 (para. 15).

⁹³ *Notice*, 15 FCC Rcd at 25135 (para. 15).

⁹⁴ *Notice*, 15 FCC Rcd at 25135 (para. 16).

⁹⁵ *Notice*, 15 FCC Rcd at 25135 (para. 16).

⁹⁶ *Notice*, 15 FCC Rcd at 25135 (para. 16).

⁹⁷ GE Americom Comments at 5-6.

⁹⁸ Loral Comments at 4-5. *See also* Telesat Comments at 2 (there is precedent for the power reduction approach for coordinating non-routine operations).

⁹⁹ Onsat Reply at 2-4. The International Bureau (Bureau) authorized Onsat to operate a

39. PanAmSat, however, asserts that this procedure would be burdensome for operators of potentially affected satellites.¹⁰⁰ PanAmSat is concerned that adopting the Commission's proposed streamlined procedure would allow the number of smaller-than-routine antennas to increase, without providing sufficient assurance that those earth stations will not cause harmful interference to routine operations. PanAmSat is also concerned that the proposal blurs the bright line between routine and non-routine earth stations.¹⁰¹ Spacenet seems to interpret the power reduction proposal, intended to give applicants one option to seek authority to use non-routine antennas, as a *requirement* that all non-routine antennas operate at reduced power, and it opposes such a requirement.¹⁰²

40. We adopt the proposal to facilitate licensing of earth stations with smaller-than-routine antennas by allowing the applicant to reduce its power to compensate for the smaller antenna size. Contrary to PanAmSat's contention, this power reduction process should prevent non-routine diameter earth stations from causing harmful interference into other satellite systems. We will continue to review non-routine earth stations on a case-by-case basis, and we will not grant any earth station application proposing a non-routine antenna size without determining that the power reduction is sufficient to prevent harmful interference into other satellite systems. We also disagree with PanAmSat that this new procedure blurs the distinction between routine and non-routine earth stations. Rather, this new procedure enables us to process certain non-routine earth station applications more quickly than we do currently. The power reduction procedure is similar to the procedure in effect for VSAT systems,¹⁰³ and we have not experienced any problems with this procedure in that context.

41. Accordingly, applicants seeking authority to operate an earth station with a non-routine antenna diameter may expedite the processing of their applications by reducing their transmit power levels dB for dB to compensate for the amount that their antenna gain patterns exceed the Section 25.209 envelope. In other words, we will process non-routine earth station applications more quickly if the applicant reduces its proposed power levels enough to reduce the EIRP levels in the antenna's side lobes below the limits implied by the combination of Section 25.209 and the relevant power level requirements¹⁰⁴ at all off-axis angles.¹⁰⁵ This will enable

CSAT system using 3.7-meter C-band earth station antennas, based in part on an affidavit from its target satellite operator. *Onsat Order*, 15 FCC Rcd at 24491-92 (para. 8). Onsat maintains that it may be difficult for an earth station operator to obtain an affidavit from an adjacent satellite operator, with whom it does not have a contractual relationship. *Onsat Reply* at 3-4. We note that earth station operators electing the certification procedure we adopt below will be required to obtain certification only from the target satellite operator with whom they have contracted to communicate.

¹⁰⁰ PanAmSat Comments at 4.

¹⁰¹ PanAmSat Comments at 2-3; PanAmSat Reply at 1.

¹⁰² Spacenet Comments at 14-22 (*emphasis added*).

¹⁰³ See 47 C.F.R. § 25.134(c).

¹⁰⁴ The "relevant power requirements" are in Section 25.134 for VSAT systems, and in Section 25.212 for other earth stations.

¹⁰⁵ Section 25.209(a) allows licensees to exceed the antenna gain pattern envelope at off-axis angles greater than 7°, but by no more than 10 percent of the sidelobe, and no sidelobe is allowed to exceed

earth station applicants to request authority for smaller-than-routine antenna sizes without undergoing the ASIA process.¹⁰⁶ It will also allow us to grant earth station applications proposing sufficient power reductions without requiring coordination with adjacent satellite operators, provided that there are no other defects in the application.

42. By requiring applicants using this process to decrease their EIRP levels at all off-axis angles, these earth stations will appear like routine earth stations to adjacent satellites. Therefore, we adopt the Commission's proposal to grant ALSAT licenses to these earth station applicants. We also will not extend protection from receiving interference to non-routine earth stations whose operators reduce their power and do not obtain coordination agreements with adjacent satellite operators.¹⁰⁷ We will include this provision as a condition on earth station licenses granted pursuant to this process. In addition, we place those licensees on notice that they will be required to accept interference from a licensed operator operating within the limits of Section 25.209 and the relevant power limits, or in other words, ALSAT-designated earth stations meeting routine processing requirements.

43. Finally, contrary to Spacenet's assertion otherwise, we are not requiring earth station operators to reduce their power. This is simply one option available to applicants seeking authority to use antennas with non-routine antenna sizes. Non-routine earth station applicants are also free to proceed under the affidavit process discussed below. Of course, applicants are also free to apply for licenses to use routine antennas at routine power levels.

3. Affidavits or Certifications

44. *Background.* As an alternative to reducing power, we also proposed to allow earth station operators using smaller-than-routine antennas to coordinate their use of a higher level of power with all potentially affected satellite within 6° of the target satellite, and with terrestrial operators.¹⁰⁸ We proposed to expedite review of these applications by permitting applicants to submit information on the antennas they propose to use, and an affidavit from the operator of each satellite with which it plans to communicate.¹⁰⁹ We envisioned that these affidavits would show that the target satellite operator has coordinated the proposed earth station operations with affected satellite systems, and terrestrial systems, where appropriate.¹¹⁰ Also, the Commission proposed requiring that the affidavits show that the satellite operator will take the earth station into account when negotiating future coordination agreements.¹¹¹ The *Notice* proposed requiring coordination with operators of satellites as far as six degrees away.¹¹²

the envelope by more than 3 dB.

¹⁰⁶ *Notice*, 15 FCC Rcd at 25135-36 (para. 17).

¹⁰⁷ *Notice*, 15 FCC Rcd at 25135 (para. 16). We make this clear in Section 25.220(c) that we adopt today. *See App. B.*

¹⁰⁸ *Notice*, 15 FCC Rcd at 25136 (para. 20).

¹⁰⁹ *Notice*, 15 FCC Rcd at 25136 (para. 21).

¹¹⁰ *Notice*, 15 FCC Rcd at 25136-37 (para. 21).

¹¹¹ *Notice*, 15 FCC Rcd at 25136-37 (para. 21).

¹¹² *Notice*, 15 FCC Rcd at 25136-37 (para. 21). Our experience with nonconforming earth

45. Because the affidavits provide certainty that the earth station will neither cause unacceptable interference to nor receive unacceptable interference from adjacent satellite systems, we proposed to extend protection from receiving interference to the smaller-than-routine earth station antennas while they operate over the particular satellites that have coordinated such operations.¹¹³ We also proposed limiting earth stations licensed under this process to communicating with the specific satellites that have been coordinated.¹¹⁴ This is because affidavits from adjacent satellite operators in a particular segment of the geostationary satellite orbital arc by themselves do not support a conclusion that the non-routine earth station will not cause unacceptable interference to or receive unacceptable interference from satellite systems in other segments of the GSO arc.¹¹⁵

46. *Discussion.* Several commenters suggest minor revisions to this procedure. First, Loral states that we should refer to the statements from satellite operators as "certifications" rather than "affidavits," because affidavits must be notarized and meet other legal requirements.¹¹⁶ We agree.

47. Spacenet argues that operators of earth stations with smaller-than-routine antennas should be required to coordinate only with satellites located at off-axis angles at which the earth station exceeds the envelope.¹¹⁷ We agree. If an earth station antenna's side lobes do not exceed the Section 25.209 envelope at, for example, four degrees off-axis, then the earth station will not cause harmful interference to a satellite located four degrees away from the target satellite if the power density into that antenna meets the applicable Part 25 rule. In that case, no useful purpose would be served by requiring the target satellite operator to coordinate with the operator of the satellite four degrees away prior to submission of the earth station application. Furthermore, in the event that a target satellite operator incorrectly concludes that a non-routine earth station's antenna will not affect a particular satellite, and decides not to coordinate with the operator of that satellite, that affected satellite operator will be given an opportunity to comment in response to the public notice procedure discussed below.

48. Telesat recommends requiring satellite operators to indicate that the smaller-than-routine antenna has been coordinated with all satellite operations within six degrees of the

stations operations demonstrates that, if coordination is completed with adjacent satellite operations plus or minus six degrees of the satellite that is accessed, the potential for unacceptable adjacent satellite interference is significantly reduced. *Notice*, 15 FCC Rcd at 25137 n.31. In cases where a non-routine antenna might affect a satellite more than six degrees, and the operator of the satellite communicating with the earth station had not coordinated with the operator of the satellite eight degrees away, we stated that we would give the operator of the potentially affected satellite an opportunity to raise its concerns. *Notice*, 15 FCC Rcd at 25137 (para. 22).

¹¹³ *Notice*, 15 FCC Rcd at 25137 (para. 23).

¹¹⁴ *Notice*, 15 FCC Rcd at 25137 (para. 23).

¹¹⁵ *Notice*, 15 FCC Rcd at 25137 (para. 23).

¹¹⁶ Loral Comments at 5-6.

¹¹⁷ Spacenet Reply at 9-10.

satellite with which the earth station will operate, both U.S.-licensed and non-U.S.-licensed.¹¹⁸ We agree that earth stations with smaller-than-routine antennas should be coordinated with all potentially affected satellites within 6° of the target satellite providing service in the United States, regardless of whether the satellite is licensed by the United States or another administration.¹¹⁹ The potentially affected satellite operators may not, however, include all satellites within 6° of the target satellite, depending on the sidelobe characteristics of the antenna as discussed above.

49. Telesat also maintains that the certifications should take into account the possibility that earth station operators using smaller-than-routine antennas may have to reduce their power to accommodate future potentially affected satellites.¹²⁰ Spacenet replies that this is inconsistent with the general philosophy that licensees have a right to be protected from others that start operations at a later date.¹²¹ We agree with Telesat. Licensees of non-two-degree-compliant operations are not generally protected from interference from two-degree-compliant operations, regardless of whether the compliant operations start before or after the non-compliant operations, and they must protect future compliant services.¹²² We expect, though, that in cases where a coordination agreement had previously been established, the parties will continue to honor that agreement when they begin operation of future replacement satellites, or seek a change to that agreement to take into account any new parameters associated with the replacement satellite.

50. We also conclude that parties opposing this certification procedure do not provide sufficient reasons for rejecting it. We disagree with Spacenet that the proposed certification procedure could delay introduction of services because it would give adjacent satellite operators an opportunity to "drag their feet" in coordination discussions.¹²³ As an initial matter, in order to expedite the certification process, we will require the target satellite operator rather than the adjacent satellite operators to coordinate with and provide the adjacent operators' certification letters to the earth station applicant. Since the earth station operator will be a customer of the target satellite operator, the target satellite operator has an incentive to obtain the certifications.¹²⁴

¹¹⁸ Telesat Comments at 2.

¹¹⁹ While we do not require coordination with satellites that do not provide service to the United States as part of our streamlined procedure for non-routine earth stations we adopt here, that coordination may be required by other Administrations.

¹²⁰ Telesat Comments at 3-4.

¹²¹ Spacenet Reply at 10-12.

¹²² See Telesat Canada, Request for Declaratory Ruling of Petition for Waiver on Earth Stations' Use of ANIK E1 and E2 Satellite Capacity to Provide Basic Telecommunications Service in the United States, *Order*, 15 FCC Rcd 3649, 3654-55 (para. 16) (Int'l Bur., 1999) (where Telesat had not shown that its satellites were two-degree-compliant, it was required to coordinate with future two-degree-compliant satellite systems or operate on a non-harmful interference basis relative to those systems with respect to services provided in the United States).

¹²³ Spacenet Comments at 22-24. Although Spacenet opposes the Commission's certification proposal, it supports the Commission's proposal to establish a 60-day period to resolve coordination issues. Spacenet Comments at 42-43. We address issues related to the 60-day coordination period below. See Seciton III.E.3.c., *infra*.

¹²⁴ As we explain further below, adjacent satellite operators will be given an opportunity to

In addition, because satellite operators have coordination discussions with each other on a regular basis, it is in their mutual interest to cooperate with each other, and in our experience, they do. Therefore, they should not have any incentive to stall the discussions. Further, we have consistently historically required that earth station operators proposing non-routine parameters bear the burden of obtaining coordination agreements.¹²⁵ By allowing earth station operators to shift some of this burden to target space station operators, we expect to expedite licensing.¹²⁶ Further, if the coordination agreements cannot be reached with all affected satellite operators, the earth station applicant may always choose to lower power as a means to obtain a license.

51. PanAmSat characterizes this procedure as a premature proposal to enforce a non-existent standard.¹²⁷ PanAmSat apparently argues that adjacent satellite operators are unable to determine whether they can accommodate non-routine earth station operations unless the Commission adopts a "standard" for non-routine earth stations. We find this argument unpersuasive. Satellite operators are aware of the link budgets and other operating parameters of their satellite systems, and are capable of determining whether a given non-routine earth station operating at a given power level can be accommodated within those link budgets, transponder plans, or business plans. In the coordination process, satellite operators use refined analyses to determine whether earth station operations can be accommodated on specific frequencies, and therefore could be granted. Satellite operators do not need the Commission to adopt standards for non-routine earth station operations to make that determination.

52. Consequently, we adopt our proposal to expedite our review of smaller-than-routine earth station antennas by allowing applicants to submit, as exhibits to their applications, certifications from the operators of the satellites with which they intend to communicate that demonstrate that all affected satellite operators have taken the non-routine operations into account in their coordination negotiations.¹²⁸ These certifications should be obtained through coordination negotiations between the target satellite operator and potentially affected satellite operators. As we observed in the *Notice*, this procedure enables us to eliminate the burdens associated with the ASIA requirement, while still ensuring that communications with those earth station antennas will not cause unacceptable interference into "routine" operations.¹²⁹ Finally, because this certification procedure applies to all smaller-than-routine antennas, including VSAT antennas, we delete Section 25.134(c) of the Commission's rules, which now requires VSAT

comment if they disagree with the target satellite operator whether coordination has been completed.

¹²⁵ See, e.g., 47 C.F.R. § 25.134(c).

¹²⁶ We also observe that earth station operators are free to expedite this process further by performing an interference analysis that demonstrates the lack of or the level of potential interference from the proposed earth station operations and serving it on the target and adjacent satellite operators.

¹²⁷ PanAmSat Comments at 4.

¹²⁸ The requirements for these certifications are spelled out in the rule revisions we adopt in Appendix B. In summary, the certifications must state that adjacent satellite operators are aware of the non-routine earth station operations, that the earth station will not cause harmful interference into those adjacent satellite operations, and the satellite operators can tolerate any interference that may be caused by those earth station operations.

¹²⁹ *Notice*, 15 FCC Rcd at 25136 (para. 21).

licensees rather than the satellite operator to coordinate with operators of future two-degree-compliant satellites, as inconsistent with this procedure.¹³⁰

4. Other Non-Routine Antenna Gain Pattern Issues

a. Submission of Antenna Gain Patterns

53. We explained in the *Notice* that we require applicants seeking authority to use non-routine earth station antennas to certify that certain specific antenna radiation pattern tests have been performed, including co- and cross-polarization, at the bottom, middle, and top of each allocated frequency band, in both the vertical and horizontal planes, plus and minus nine degrees.¹³¹ Nevertheless, to assess the interference potential fully, we often request the applicant to submit copies of the antenna gain patterns for these test plots.¹³² These requests can be time-consuming.¹³³ Therefore, we invited comment on requiring earth station applicants to submit a copy of these antenna gain patterns when they seek authority to use a smaller-than-routine antenna,¹³⁴ as part of both the power reduction and certification procedures.

54. Loral and PanAmSat support this proposal, while no comments were received in opposition.¹³⁵ Accordingly, we adopt it. Submission of antenna gain patterns will pose minimal additional burdens on non-routine earth station license applicants, and will enable the Commission to process their applications more rapidly.¹³⁶ This information is vital for calculating the needed power reduction. It will also assist operators of satellites located more than six degrees from the target satellite in determining whether their operations will be affected by the smaller-than-routine earth station antenna.

55. In addition to submitting these patterns to the Commission, PanAmSat recommends that we require applicants to serve antenna gain patterns on potentially affected satellite operators, to expedite coordination of those non-routine earth station operations.¹³⁷ GE Americom agrees and would also require non-routine earth station operators to provide potentially affected satellite

¹³⁰ See 47 C.F.R. § 25.134(c). See also Hughes Comments at 27-28; SIA December 10, 2001 *Ex Parte* Statement at 29-30.

¹³¹ *Notice*, 15 FCC Rcd at 25138 (para. 25), citing 47 C.F.R. § 25.132(a).

¹³² *Notice*, 15 FCC Rcd at 25138 (para. 25), citing 47 C.F.R. § 25.132(b)(1).

¹³³ *Notice*, 15 FCC Rcd at 25138 (para. 25).

¹³⁴ *Notice*, 15 FCC Rcd at 25138 (para. 25).

¹³⁵ Loral Comments at 10; PanAmSat Comments at 5. See also Spacenet Comments at 43-44, 46.

¹³⁶ The Commission argued that an antenna gain pattern requirement would pose minimal additional burdens on earth station applicants because the earth station operator has an established relationship with its antenna manufacturer. *Notice*, 15 FCC Rcd at 25138 (para. 26).

¹³⁷ PanAmSat Comments at 5. See also SIA Reply at 5; Hughes Reply at 11 (applications should be served on "adjacent satellite operators +/- 6 degrees of each satellite with which the non-routine applicant seeks to coordinate").

operators with transmit and receive frequency parameters and maximum and minimum power level and density.¹³⁸ Spacenet asserts that requiring non-routine earth station applicants to serve potentially affected satellite operators is burdensome for earth station applicants and unnecessary given that the public notice process already alerts potentially affected operators to the non-routine earth station.¹³⁹

56. We agree with Spacenet that it is not necessary to require earth station license applicants to serve antenna gain patterns on affected satellite operators. As discussed elsewhere in this Order, we expect the desired (or target) satellite operator(s) to coordinate non-routine earth station operations with other affected satellite operators.¹⁴⁰ Therefore, in most cases, we expect the earth station operator to provide the antenna gain patterns and other relevant technical information to the target satellite operator(s), who can then coordinate with affected satellite operators, *before* the earth station applicant files an application with the Commission.

57. Hughes recommends maintaining a database on the Commission's website for contact information for satellite operators on an orbit location-by-orbit location basis.¹⁴¹ Contact information for satellite operators is already available in satellite license applications that can be downloaded from the IBFS database available on our website.¹⁴² We are in the process of organizing this information in an orbit location-by-orbit location format. In the meantime, all satellite applications and licenses, however, are publicly available, and Hughes and other satellite operators may use this information to establish points of contact on a location-by-location basis should they wish to do so.

58. Finally, Hughes requests us to clarify that the antenna gain patterns in Appendix A of the *Notice* are not intended to limit the size or shape of antennas based on circular aperture.¹⁴³ We do so. The Appendix A antenna gain patterns were included for illustrative purposes only, and were not intended to limit earth station operators' choice of antenna.

b. List of Approved Non-Routine Antennas

59. Spacenet and Hughes recommend establishing a database of approved non-routine antennas.¹⁴⁴ We agree that such a database would help expedite our review of non-routine earth station applications. We also find that a website listing approved non-routine antennas, including antenna gain patterns and the conditions placed on the use of each antenna, would be as helpful as a database would be, and could be implemented more quickly. Accordingly, we direct the

¹³⁸ GE Americom Comments at 6.

¹³⁹ Spacenet Reply at 15.

¹⁴⁰ *See, e.g.*, Section III.E.

¹⁴¹ Hughes Reply at 11.

¹⁴² *See* <<www.fcc.gov>>.

¹⁴³ Hughes Comments at 27.

¹⁴⁴ Hughes Reply at 10-11; Spacenet Comments at 43-44, 46. *See also* GCI Further Comments at 1-3.

International Bureau to establish a List of Approved Non-Routine Antennas on its website, and we delegate authority to the Bureau for this purpose.¹⁴⁵

D. Non-Routine Power Levels

60. *Background.* In addition to antenna size, earth stations may be considered as "non-routine" due to their transmitting power, regardless of size. In this Section, we adopt our proposal to streamline the process for earth station applications proposing higher-than-routine power levels by adopting a certification procedure similar to the certification procedure we adopted above for earth stations proposing smaller-than-routine antennas.

61. In the *Notice*, the Commission explained that its two-degree spacing rules establish power limits for fixed-satellite earth stations.¹⁴⁶ Earth station applicants are not prohibited from seeking authority to operate at higher power levels, but the Commission staff reviews those applications on a case-by-case basis rather than processing them routinely.¹⁴⁷ The Commission also noted that Section 25.134 of its rules¹⁴⁸ requires earth station applicants seeking a VSAT license to submit an ASIA if they plan to operate at non-routine power levels.¹⁴⁹ In the case of other types of earth stations, the rules do not explicitly set forth any procedure for demonstrating that a higher power level will not cause unacceptable or harmful interference in a particular case. As a result, applicants requesting authority to operate at power levels higher than those specified in those rules often submit an ASIA.¹⁵⁰

62. The *Notice* sought comment on replacing the ASIA requirement for non-routine power levels with a self-certification process.¹⁵¹ Under this proposal, an earth station applicant would provide, as exhibits to its application, certifications of its own and from the operator of each satellite with which the non-routine earth station power and power density levels will be communicating.¹⁵² The earth station operator would be authorized to use the non-routine power and power density levels only with those satellites for which certifications are provided.¹⁵³ Thus,

¹⁴⁵ In 1999, the Commission announced an intention to consider developing a "type acceptance" program for satellite earth station equipment. *See* Commission Launches Earth Station Streamlining Initiative, *Public Notice*, DA 99-1259 (released June 25, 1999). This List of Approved Non-Routine Antennas will serve the same purpose of a type acceptance program with respect to non-routine antennas.

¹⁴⁶ *Notice*, 15 FCC Rcd at 25140 (para. 31), *citing* 47 C.F.R. §§ 25.134 (VSAT networks), 25.211 (video transmissions), 25.212 (narrowband transmissions).

¹⁴⁷ *Notice*, 15 FCC Rcd at 25140 (para. 31).

¹⁴⁸ 47 C.F.R. §25.134.

¹⁴⁹ *Notice*, 15 FCC Rcd at 25140 (para. 31), *citing* 47 C.F.R. §25.134(b).

¹⁵⁰ *Notice*, 15 FCC Rcd at 25140 (para. 31).

¹⁵¹ *Notice*, 15 FCC Rcd at 25140 (para. 32).

¹⁵² *Notice*, 15 FCC Rcd at 25140 (para. 32).

¹⁵³ *Notice*, 15 FCC Rcd at 25140 (para. 32).

earth station applicants using this procedure would not be eligible for an ALSAT earth station license. In the *Notice*, the Commission contemplated requiring the same information in certifications regarding power-level coordination as it proposed for smaller-than-routine antenna size coordination. Specifically, these certifications should show that the target satellite operator has coordinated the proposed earth station operations with affected satellite systems and terrestrial systems, and that the satellite operator will take the earth station into account when negotiating future coordination agreements.¹⁵⁴

63. *Discussion.* PanAmSat opposes allowing earth station applicants proposing non-routine power levels to self-certify that their operations are consistent with existing or new coordination agreements. According to PanAmSat, those earth station applicants face a conflict of interest because they have an incentive to interpret coordination agreements more liberally than an adjacent satellite operator would.¹⁵⁵ PanAmSat also states that allowing earth station applicants to submit a self-certification rather than an interference analysis deprives adjacent satellite operators of the opportunity to review the applicant's analysis. PanAmSat claims that expecting adjacent satellite operators to monitor non-routine earth station applications and conduct their own interference analyses places an unreasonable burden on those satellite operators.¹⁵⁶ Spacenet disagrees that a self-certification process would be unworkable.¹⁵⁷

64. We do not believe that earth station operators using non-routine power levels would face a conflict of interest. The procedure set forth in the *Notice* requires the operator of the satellite communicating with the non-routine earth station (the "target" satellite) to coordinate the non-routine power levels with operators of potentially affected satellites within 6°, and to certify that coordination has been completed. We will dismiss earth station applications requesting authority to operate at non-routine power levels unless this certification is included with the application. We have always relied on satellite operators to comply with the coordination agreements they make with each other, and we see no reason why we cannot continue do to so in this context. Furthermore, potentially affected satellite operators have an opportunity to comment on the earth station application, and to explain their specific concerns regarding the proposed antenna, as set forth below. Accordingly, we adopt our proposal for non-routine power levels.

65. SIA supports allowing earth station operators to attempt to coordinate a higher-than-routine EIRP density, but only if the proposed EIRP density is limited to 13 dBW/4 kHz.¹⁵⁸ However, if a non-routine earth station operator can successfully coordinate its operations with an EIRP density greater than 13 dBW/4 kHz, then we see no reason to preclude the earth station from operating at that power level with the particular target satellite that has been coordinated. Accordingly, we will not place a limit on coordinated EIRP density.

¹⁵⁴ Compare *Notice*, 15 FCC Rcd at 25140 (para. 32) (power certifications) with *Notice*, 15 FCC Rcd at 25136-37 (para. 21) (antenna size certifications). See also *Notice*, 15 FCC Rcd at 25188-89 (App. B, proposed Sections 25.220(d)(1) and (e)(1).)

¹⁵⁵ PanAmSat Comments at 6-7.

¹⁵⁶ PanAmSat Comments at 7.

¹⁵⁷ Spacenet Reply at 13-14.

¹⁵⁸ SIA Further Comments at 25-26.

E. Satellite Coordination Negotiations to Reflect Non-Routine Antennas and Power Levels

1. Background

66. Above, we adopted a certification procedure for earth station applications proposing smaller-than-routine earth station antennas and higher-than-routine power levels. Under both of these certification procedures, we expect coordination to be completed, and any objections raised by adjacent satellite operators to be resolved, prior to the time the earth station application is filed. However, the *Notice* also invited comment on establishing an additional procedure to provide an opportunity for additional coordination negotiations after the non-routine earth station application is filed.¹⁵⁹ We intended this procedure to be a backstop mechanism to ensure that the satellite operator has not mistakenly overlooked any potentially affected satellite operator, including those where a satellite is located more than six degrees away from the target satellite.

67. Under our proposal, we would place non-routine earth station applications on Public Notice identifying the applicant's proposed frequency bands, antenna diameters, and power and power density for each antenna, and the satellite or satellites that the applicant intends to use.¹⁶⁰ We also proposed allowing 30 days for comment.¹⁶¹ In addition, we solicited comment on whether we should afford operators of any potentially affected satellite, including satellites more than six degrees away from the target satellite, an additional 60 days after the comment deadline to resolve coordination issues that may be identified in the 30-day comment period.¹⁶² After the 60-day deadline, the Commission proposed to authorize the earth station to communicate at its requested higher power levels with all satellites for which it has submitted certifications, and for which it has received no indication that there are any unresolved issues.¹⁶³ The Commission would not authorize the earth station to communicate with satellites for which there are unresolved issues. We adopt this proposal as discussed below.

2. Post-Filing Coordination

68. PanAmSat and Hughes object to this additional coordination period, arguing that coordination issues with adjacent satellite operators should be resolved before the non-routine earth station operator files its application.¹⁶⁴ We agree. Consequently, we expect that, in the vast majority of cases, no objections will be filed during the 30-day comment period, and we will be in a position to grant the non-routine application. Nevertheless, we envision that the target satellite operator may occasionally overlook a potentially affected satellite,¹⁶⁵ and that there may

¹⁵⁹ *Notice*, 15 FCC Rcd at 25141 (para. 34).

¹⁶⁰ *Notice*, 15 FCC Rcd at 25141 (para. 35).

¹⁶¹ *Notice*, 15 FCC Rcd at 25141 (para. 35).

¹⁶² *Notice*, 15 FCC Rcd at 25141 (para. 35).

¹⁶³ *Notice*, 15 FCC Rcd at 25141 (para. 35).

¹⁶⁴ PanAmSat Comments at 8; Hughes Reply at 10.

¹⁶⁵ By "potentially affected satellites," we mean satellites that lie in the direction of a side lobe that exceeds the antenna gain pattern envelope.

be cases in which a potentially affected satellite is located more than 6° away from the target satellite. Thus, the Public Notice and additional coordination procedure provide needed assurance that all potentially affected parties have agreed to the non-routine operations. We revise Sections 25.220(a)(4) and 25.154(e) in Appendix B of this Order to make this procedure clear.

69. Similarly, Loral recommends requiring that coordinations with U.S.-licensed satellite operators be completed before the earth station application is filed, but maintains that more time should be allowed to complete coordination negotiations with non-U.S.-licensed satellite operators.¹⁶⁶ We see no reason to adopt different rules for coordination negotiations with non-U.S.-licensed satellite operators and for negotiations with U.S.-licensed satellite operators. We will permit an additional 60-day coordination period for *all* parties not adequately consulted prior to the application being filed.¹⁶⁷

3. Modification or Clarification of Requirements

a. Thirty-day Public Notice Period

70. WorldCom requests that we grant unopposed applications after the 30-day public notice period, without waiting for the 60-day coordination period to pass.¹⁶⁸ Spacenet argues that any space station operator that does not respond within this 30-day period should be constructively considered to have consented to the non-routine earth station operations.¹⁶⁹ Telesat opposes licensing non-conforming earth stations if no potentially affected satellite operator objects within 30 days. Telesat argues that the onus should be on the non-conforming earth station operator rather than other satellite operators. Telesat claims that non-U.S.-satellite operators may not monitor Commission public notices.¹⁷⁰

71. We will act on unopposed non-routine earth station applications at the end of the 30-day Public Notice period. This post-public notice coordination procedure should be a backstop mechanism to ensure that the non-routine operations have been coordinated with all potentially affected satellite operators. In all but rare instances, we expect that these coordination negotiations will be completed prior to the filing of the earth station application, including coordination with non-U.S.-licensed satellite operators. With respect to Telesat's concerns, we expect the target satellite operator to be aware of all potentially affected operators, including non-U.S. operators. Moreover, all U.S. satellites must be coordinated with non-U.S. satellites under procedures established by the ITU. If a U.S. satellite operates outside of a coordination

¹⁶⁶ Loral Comments at 8-9.

¹⁶⁷ PanAmSat opposes this proposal, claiming that non-routine earth station operators do not have as much incentive as adjacent satellite operators to prevent adjacent satellite interference, and so may construe existing or new coordination agreements more liberally than adjacent satellite operators do. PanAmSat Comments at 8; PanAmSat Reply at 2. This argument is substantially similar to PanAmSat's objections to the certification procedures we adopt above. We reject PanAmSat's arguments, for the same reasons that we rejected those arguments above.

¹⁶⁸ WorldCom Comments at 4.

¹⁶⁹ Spacenet Reply at 15-16. *See also* 47 C.F.R. §§ 25.203(c)(3), 101.103(d).

¹⁷⁰ Telesat Comments at 2-3.

agreement and causes harmful interference, it is in violation of U.S. treaty obligations. In that case, the interfering transmissions must be terminated immediately. Further, the Commission can initiate an enforcement action against a licensee that certified that its operations had been coordinated with all potentially affected parties within 6° of the target satellite when it had not.¹⁷¹ Thus, we see no reason to treat U.S. and non-U.S. operators differently. Accordingly, if no comments are filed at the end of the 30-day public notice period, we see no reason to delay action on the earth station application.

72. WorldCom requests that we clarify that we will consider oppositions filed by parties other than satellite operators.¹⁷² We will not preclude any party from raising concerns about non-routine earth station applications. In particular, terrestrial wireless operators are free to raise issues regarding non-routine earth stations operating in shared bands.

73. Loral argues that the 60-day coordination period should be triggered by an informal notification by any interested party that negotiations are ongoing, rather than requiring a formal comment or petition.¹⁷³ We disagree. As we explain further below, we do not intend to deny a non-routine earth station application on the basis of a frivolous opposition. Therefore, commenters seeking to initiate this 60-day coordination process should provide some explanation on the nature of the coordination issue it is raising. This "formal" comment or petition does not need to be a lengthy document, but it should provide enough detail to show that the commenter's objection is not frivolous.

b. Details of Coordination Negotiations

74. GE Americom opposes any time limit for resolution of coordination issues with potentially affected satellite operators, asserting that this time limit might interfere with satellite operators' ability to protect their customers from interference.¹⁷⁴ We disagree. First, we expect the coordination negotiations between the target satellite operator and potentially affected satellite operators to be completed before the non-routine earth station application is filed. Second, adjacent satellite operators are given an additional opportunity to voice concerns during the 30-day Public Notice period and to attempt to resolve those concerns during the 60-day coordination period. Finally, if a non-frivolous objection is not adequately resolved, we will not authorize the non-routine earth station to communicate with the target satellite at issue at the power levels proposed in the earth station application. Rather, we will grant the application at the coordinated powers and the coordinated satellites only.¹⁷⁵

¹⁷¹ See 47 C.F.R. § 1.17 (requiring license applicants to make truthful and accurate statements in Commission submissions).

¹⁷² WorldCom Comments at 4.

¹⁷³ Loral Petition at 8.

¹⁷⁴ GE Americom Comments at 7.

¹⁷⁵ In cases where the earth station applicant proposes to use a routine antenna, but a higher-than-routine power level, and the applicant does not coordinate the higher power level, the Commission can authorize the applicant to operate at a routine power level.

75. GE Americom maintains that non-routine earth station operators should bear the burden of providing target space station operators and potentially affected space station operators with technical information and of working with space station operators to resolve coordination issues.¹⁷⁶ Non-routine earth station operators already have a strong incentive to provide their target satellite operators with the information needed to complete coordination negotiations with other affected satellite operators. Without that information, the satellite operators will not be able to reach agreement, and we will not be able to grant the earth station application as requested. Therefore, we do not find it necessary at this time to require that earth station applicants provide any more information to satellite operators than is already required in their earth station applications to the Commission.¹⁷⁷

76. WorldCom requests that the Commission take some measure to ensure that coordination issues are resolved in a timely manner, although WorldCom does not have any specific recommendation.¹⁷⁸ We find that establishing a timetable for the negotiations should ensure that coordination issues are resolved in a timely manner as WorldCom requests. Accordingly, we decline to adopt any additional measures at this time. Any such measures would probably involve the Commission intervening in the coordination negotiations. We have no basis for concluding whether or under what circumstances such Commission intervention would be appropriate.

c. Conclusion of Coordination Negotiations

77. Loral recommends that we grant earth stations authority to communicate with all space stations with whom the coordination issues have been resolved at the end of the 60-day coordination period, and requests that we clarify that we will not grant authority to communicate with satellites for which coordination issues remain unresolved.¹⁷⁹ We will grant earth station applications in part with respect to those space stations with which the coordination issues have been resolved at the end of the 60-day period. In other words, in cases where a non-routine earth station applicant requests authority to communicate with two or more specific target satellites, and some but not all of those target satellite operators have reached agreements with its neighboring satellite operators regarding the non-routine earth station, we will authorize the earth station operator to communicate only with the target satellite operators that have reached agreements with all their neighbors. There is no reason to deny those applications with respect to a target satellite once the issues related to that target satellite has been resolved. We cannot state categorically that we will deny all non-routine earth station applications with respect to those space stations with which the coordination issues remain outstanding. We reserve the authority to grant a non-routine earth station in the public interest, with conditions if necessary, in spite of an unresolved comment or petition to deny, in the unlikely case that a petitioner files a frivolous petition to deny.

¹⁷⁶ GE Americom Comments at 7.

¹⁷⁷ Non-routine earth station applicants are free to provide such technical information to adjacent satellite operators on a voluntary basis, however, particularly in cases where they believe that providing this information might expedite the coordination process.

¹⁷⁸ WorldCom Comments at 4.

¹⁷⁹ Loral Comments at 9-10.

78. WorldCom suggests that we adopt a streamlined procedure for adding satellites to a non-routine earth station license if the coordination issues are resolved after the 60-day period, or to treat such additions as minor modifications.¹⁸⁰ We will not do so. Earth station operators may make minor modifications without prior Commission authorization and without public notice.¹⁸¹ In cases where the coordination issues raised by communications with a particular satellite are so complicated that they cannot be resolved in the 60-day coordination period, it would be unreasonable to enable an earth station operator to add that satellite to its license without allowing an opportunity for all operators of potentially affected by communications to the new satellite. Therefore, we will consider each new satellite point of communication as a major modification. We revise our rules to make this clear.

79. Spacenet recommends establishing a 10-day period after the end of the 60-day coordination period, in which earth station applications would be deemed granted without any further action by the Commission unless the Commission states otherwise.¹⁸² We will not adopt Spacenet's recommendation at this time. Instead, we adopt a goal of issuing such earth station licenses within an average of 10 business days after at the end of the of the 60-day coordination period.¹⁸³ This will allow us to include on the license any conditions specific to the non-routine earth station operations while still granting authority in an expedited manner.

F. Public Notice Language

80. The *Notice* invited comment on requiring non-routine earth station applicants to submit the information below as an "informative" as an attachment to the application. While much of this information appears elsewhere in the application, we invited comment on providing this information in a uniform format to streamline and expedite the placement of non-routine earth station applications on public notice.¹⁸⁴

¹⁸⁰ WorldCom Comments at 4.

¹⁸¹ See 47 C.F.R. § 25.118.

¹⁸² Spacenet Comments at 43.

¹⁸³ For the definition of "business day," see 47 C.F.R. § 1.4(e)(2).

¹⁸⁴ *Notice*, 15 FCC Rcd at 25142 (paras. 37-38).

- A detailed description of the service to be provided, including frequency bands and satellites to be used.
- The diameter of the antenna.
- Proposed power and power density levels.
- Identification of any random access technique, such as the Aloha multiple access technique, if applicable.¹⁸⁵
- Identification of any rule or rules for which a waiver is requested.

The Commission explained that it was trying to achieve a reasonable balance between limiting administrative burdens on earth station applicants, expediting the licensing process, and enabling interested parties to make informed decisions about whether they should file petitions to deny the application.¹⁸⁶

81. PanAmSat and Spacenet support this proposal, and PanAmSat recommends that we generate a public notice automatically.¹⁸⁷ PanAmSat suggests requiring the following information for inclusion in the public notice: (a) antenna gain and cross-polarization information; (b) the eastern and western boundaries of the arc the applicant is seeking to coordinate; and (c) the modulation scheme for any random access technique.¹⁸⁸ Spacenet opposes requiring the modulation scheme for any random access technique because it may be proprietary.¹⁸⁹ Spacenet also maintains that antenna gain and cross-polarization information requires several pages of charts, and would be difficult to incorporate into a public notice.¹⁹⁰

82. We adopt our proposal to require earth station applicants to submit specific information as an attachment to the application that can be easily incorporated into a public notice.¹⁹¹ In addition, to clarify the scope of potentially affected satellite operators, we will

¹⁸⁵ Random access techniques are used in VSAT networks, which, as noted above, are generally comprised of a hub station that transmits to a satellite and to multiple technically identical remote small aperture antennas which receive transmissions from the satellite and provide return transmissions to the hub earth station. A random access technique is a method of controlling traffic within a VSAT network. The Commission discusses random access techniques in detail in the *Notice* and *Further Notice*. See *Notice*, 15 FCC Rcd at 25145-46 (paras. 50-51); *Further Notice*, 17 FCC Rcd at 18613-14 (paras. 74-75). See also Petition of Spacenet, Inc. for a Declaratory Ruling that Section 25.134 of the Commission's Rules Permits VSAT Remote Stations in the Fixed Satellite Service to Use Network Access Schemes that Allow Statistically Infrequent Overlapping Transmissions of Short Duration, or, in the Alternative, For Rulemaking to Amend that Section, *Order*, 15 FCC Rcd 23712 (Int'l Bur., 2000).

¹⁸⁶ *Notice*, 15 FCC Rcd at 25142 (para. 38).

¹⁸⁷ PanAmSat Comments at 8-9; Spacenet Comments at 44; Spacenet Reply at 20. See also SIA Reply at 5.

¹⁸⁸ PanAmSat Comments at 9. See also SIA Reply at 5.

¹⁸⁹ Spacenet Reply at 20 n.33.

¹⁹⁰ Spacenet Reply at 21.

¹⁹¹ *Notice*, 15 FCC Rcd at 25142 (para. 38), 25178 (App. B, proposed Section 25.130(a)).

require applicants to identify the specific satellites with which they plan to communicate, as PanAmSat suggests.

83. We do not adopt PanAmSat's other suggestions for additional information. We agree with Spacenet that including antenna gain patterns in public notices would delay public notices. In addition, it is not necessary to include that information in public notices because the earth station operator should provide all information needed by the target space station operator to complete coordination, including the gain pattern of any proposed antenna with a non-routine antenna gain pattern. Moreover, the Commission now requires all earth station applications to be filed electronically,¹⁹² and so the information in earth station license applications, including the antenna gain pattern, is readily available through IBFS, the International Bureau's electronic filing system.

G. Conclusion

84. In this Section, and in Section 25.220 of our rules as set forth in Appendix B, we adopt streamlined procedures for considering non-routine earth station applications. An applicant can seek authorization for earth stations with smaller-than-routine antennas under one of two procedural options to demonstrate that it will not cause adjacent satellite interference. It can either (1) reduce the power into its non-compliant antenna, or (2) obtain certifications from the operators satellites with which the earth station operator plans to communicate, showing that those satellite operators have coordinated with the operators of satellites located within six degrees of the target satellite, and that those other potentially affected satellite operators do not oppose the non-compliant operations. These certifications should be filed with the application. Earth station operators that reduce their power levels are eligible to be protected from receiving harmful interference only to the extent that harmful interference would not be caused to an earth station employing an antenna conforming to the antenna gain patterns in the Commission's rules.¹⁹³ Earth station operators that provide certifications will be authorized to operate only with the satellites whose operators provided certifications from the operators of their neighboring satellites, and will be protected from receiving interference from those satellites respectively.

85. We also adopt a procedure for applicants to operate earth stations at non-routine power levels. This procedure is identical to the certification procedure for earth stations with smaller-than-routine antennas, described above.

86. Under both procedures, we will place the application on 30 days public notice, to be followed by a 60-day timetable for coordination negotiations between satellite operators if any comments are filed in response to the application. If non-routine earth station operations are not coordinated with the satellites neighboring a target satellite at the end of the 60-day period, we will not authorize the earth station to communicate with that satellite. In addition to this 30-day public notice and 60-day coordination requirement, all parties filing non-routine earth station applications must provide information for an "informative," as an attachment to the earth station application, to be placed in the public notice, as discussed above.¹⁹⁴

¹⁹² *Third Report and Order*, 18 FCC Rcd at 13508-09 (paras. 64-67) (mandatory electronic filing for routine earth station applications); *Fourth Report and Order*, 19 FCC Rcd at 7421-22 (paras. 3-6) (mandatory electronic filing for all earth station applications).

¹⁹³ *See* 47 C.F.R. § 25.209(c).

¹⁹⁴ Section III.F. above.

87. We expect that these procedures will cover the vast majority of non-routine applications. However, it is possible that a non-routine earth station applicant's target space station operator is unable to obtain certifications from its adjacent satellite operators, but can operate interference-free in a two-degree-spacing environment without reducing its power. In that unlikely event, the earth station license applicant may file a petition for waiver of the Section 25.220 procedures. We would consider granting that waiver request and license application if the applicant can demonstrate "good cause" for that request.¹⁹⁵ The applicant is permitted, but not required, to submit an ASIA as part of its showing.

IV. RELAXATION OF CURRENT REQUIREMENTS

A. Background

88. In addition to establishing a streamlined procedure for non-routine earth station applications, the Commission invited comment on relaxing other earth station licensing requirements. Thus, the Commission proposed measures to facilitate a number of earth station applications, as well as the non-routine applications fundamental to the development of satellite-based broadband Internet access. We address these issues below.

B. Earth Station Power and Power Density Limits

1. Background

89. One of the primary measures we use to prevent harmful interference in a 2° spacing environment is to limit earth station power and power density. This includes both downlink transmissions from the satellite into the earth station and uplink transmissions from the earth station to the satellite. In the *Notice*, we invited comment on increasing the earth station power level limits contained in Sections 25.134, 25.211, and 25.212.¹⁹⁶ We observed that, over the years, we have decreased the size of earth station antennas eligible for routine processing, but we have not reexamined the power spectral density requirements from the earth station, even though a smaller earth station antenna may require higher input power.¹⁹⁷ Accordingly, we invited parties to propose new power limits that reflect technological advances and smaller antennas. We requested commenters to demonstrate that their proposed power levels would protect existing and future users from receiving and causing harmful or unacceptable interference to or from adjacent satellite networks.¹⁹⁸

¹⁹⁵ 47 C.F.R. § 1.3. For more on the meaning of "good cause" within the meaning of Section 1.3, see *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969), *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C.Cir. 1990).

¹⁹⁶ 47 C.F.R. §§ 25.134, 25.211, 25.212; *Notice*, 15 FCC Rcd at 25142-43 (paras. 39-40).

¹⁹⁷ *Notice*, 15 FCC Rcd at 25142-43 (paras. 39-40). Decreasing antenna size decreases mainbeam antenna gain. Therefore, more power into the antenna (transmitter power for the uplink or received power from the satellite downlink) may be required to achieve the same link budget to complete the satellite communication link. *Notice*, 15 FCC Rcd at 25142-43 (para. 40).

¹⁹⁸ *Notice*, 15 FCC Rcd at 25142-43 (para. 40). "Adjacent" in this context means adjacent orbit locations in the geostationary satellite orbit.

2. Satellite Downlink Power Levels

a. Ku-band VSAT Systems

90. *Background.* In response to the Commission's proposals in the *Notice*, many commenters proposed increasing the downlink equivalent isotropically radiated power (EIRP)¹⁹⁹ limits applicable to Ku-band VSAT networks. VSAT networks are generally comprised of a hub station that transmits to a satellite and to multiple technically identical remote small aperture antennas which receive transmissions from the satellite and provide return transmissions to the hub earth station.²⁰⁰ The current EIRP limits are 6 dBW/4 kHz for most VSAT networks and 13 dBW/4 kHz for narrowband analog hub-type networks.

91. Hughes asserts that satellite downlink EIRP spectral densities for Ku-band VSAT systems are too low for the smaller earth station antenna sizes currently in use. Hughes recommends increasing the EIRP density limit for outbound digital carrier transmissions (*i.e.*, transmissions from the hub to the satellite, and then to the remote earth stations), other than single-carrier full transponder and dual-carrier full transponder transmissions, from 6 dBW/4kHz to 9 dBW/4kHz. Hughes maintains that this EIRP density increase will not cause harmful interference to existing systems, based on its analysis of typical VSAT link budgets, noise budgets, and carrier-to-noise ratios.²⁰¹ SIA and Loral support this increase.²⁰² Loral, however, contends that any further relaxation of power limits may eliminate too much of satellite operators' impairment budgets, and so would decrease their ability to accommodate any new non-routine earth stations.²⁰³ Loral requests that we consider carefully and thoroughly any proposals to relax other power limits.²⁰⁴

¹⁹⁹ Equivalent Isotropically Radiated Power (EIRP) is the product of the gain of the antenna in a given direction and the power supplied to that antenna. 47 C.F.R. § 2.1.

²⁰⁰ *Further Notice*, 17 FCC Rcd at 18590 (para. 7); *Notice*, 15 FCC Rcd at 25145 (para. 50), Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, 51 Fed. Reg. 15067 (Apr. 22, 1986) (*1986 VSAT Order*).

²⁰¹ Hughes Comments at 15-16 and App. A; Hughes Reply at 6-7.

²⁰² SIA December 10, 2001 *Ex Parte* Statement at 11-15; SIA Further Comments at 25-26; Loral Comments at 10-11.

²⁰³ Loral Comments at 10-11.

²⁰⁴ Loral Comments at 11. Spacenet also supports increasing the narrowband downlink power limit from 6 dBW/4kHz to 9 dBW/4kHz. Spacenet asserts that the power increase will, in part, compensate for increases in interference to VSAT networks it claims will result when satellite systems operating in non-geostationary satellite orbit (NGSO) are introduced in the Ku-band, which is now used by GSO satellite systems, pursuant to the *Ku-band NGSO Order*. Spacenet Comments at 30-34 and Exhibits B and C, *citing* Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, *First Report and Order and Further Notice of Proposed Rulemaking*, ET Docket No. 98-206, 16 FCC Rcd 4096 (2000) (*Ku-band NGSO Order*). The Commission addressed downlink power flux density issues related to GSO/NGSO sharing in the *Ku-band NGSO Order*, and concluded that the rules it adopted in that Order were adequate to protect GSO FSS operations. *See Ku-band NGSO Order*, 16 FCC Rcd at 4128 (paras. 72-73). Therefore, we do not rely on Spacenet's comments in increasing this power limit.

92. PanAmSat asserts that we should raise the "routine" EIRP level even higher than 9 dBW/4kHz. It maintains that an increase of 4 dB, to 10 dBW/4 kHz, in the maximum permitted downlink EIRP spectral density for Ku-band VSAT systems would result in a degradation of the composite carrier to noise plus interference (C/N+I) ratio²⁰⁵ of about 0.7 dB, assuming a 6.1-meter hub earth station antenna, 1.2-meter remote earth station antennas, and two-degree orbital spacing between co-coverage satellite networks. PanAmSat asserts further that an increase in downlink EIRP spectral density of 6 dB, *i.e.*, to 12 dBW/4 kHz, would result in a degradation of the composite C/N+I ratio of about 1.3 dB under the same assumptions. PanAmSat maintains that most link budgets have a 1 dB margin, and so a higher EIRP downlink density can be tolerated.²⁰⁶ In other words, PanAmSat asserts that all earth stations currently in operation could increase their power to 10 dBW/4 kHz without causing harmful interference into each others' systems. Hughes responds that increasing the power level to 10 dBW/4kHz or higher, as proposed by PanAmSat, would create unacceptable levels of interference.²⁰⁷

93. *Discussion.* We agree with PanAmSat that we can increase the downlink EIRP spectral density limit for Ku-band VSAT systems from 6 dBW/4kHz to 10 dBW/4kHz without increasing the potential for harmful or unacceptable interference in any significant way. In making this finding, we reviewed the data we considered when we adopted the 6 dBW/4kHz limit in 1986²⁰⁸ to determine what kinds of systems would have been impacted by allowing higher downlink EIRP density limits at that time. We also determined whether those kinds of systems remain in operation and still require protection from interference. We discuss our analysis in detail in Appendix C to this Order.

94. We find that the only kinds of systems likely to be adversely affected by increasing the downlink EIRP density limit for Ku-band VSAT systems from 6 dBW/4kHz to 10 dBW/4kHz are analog narrowband hub-type systems.²⁰⁹ To compensate for the potential interference that these systems might otherwise experience from the VSAT downlink EIRP density increase we adopt here, we will also allow analog narrowband hub-type systems to increase their power by 4

²⁰⁵ The C/(N+I) ratio is the ratio of carrier power to the total power of all noise and interference sources. It is a measure of the susceptibility of the radio link to all degradations, both natural and man-made. It includes all identifiable sources of noise and interference such as thermal noise, rain fades, and both internal and external interference. It is generally presented as the final result of a "link budget" that systematically lists all such degradations.

²⁰⁶ PanAmSat Comments at 9-10.

²⁰⁷ Hughes Reply at 8.

²⁰⁸ Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, *Declaratory Order*, 1986 WL 291567 (F.C.C.) (Com. Car. Bur., released Apr. 9, 1986) at para. 13, *summarized at* 51 Fed. Reg. 15067 (Apr. 22, 1986) (*1986 VSAT Order*).

²⁰⁹ Narrowband analog hub-type systems are single-channel-per-carrier (SCPC) systems used primarily to distribute audio programming to radio stations in networks. Routine processing power density requirements for these systems were originally established in Routine Licensing of Earth Stations in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, Respectively, for Both Full Transponder and Narrowband Transmissions, *Declaratory Order*, 2 FCC Rcd 2149 (Com. Car. Bur. 1987).

dB, from 13 dBW/4 kHz²¹⁰ to 17 dBW/4 kHz. As Loral recommends, we have considered this rule revision carefully, and we conclude that this increase will not significantly increase the potential for harmful or unacceptable interference among adjacent satellite networks. This is because there are relatively few narrowband analog hub systems in operation today,²¹¹ and we expect the number of analog hub systems to decrease in the future as digital technology continues to replace analog technology in satellite networks.

95. Therefore, based on the analysis summarized in Appendix C, we adopt PanAmSat's proposal to increase the downlink EIRP density limit for Ku-band VSAT systems to 10 dBW/4kHz. We also increase the downlink EIRP density limit for analog narrowband hub-type systems to 17 dBW/4kHz.

b. Other Ku-band Earth Stations

96. *Background.* In addition to Ku-band VSAT networks, commenters propose an increase in "routine" power levels for other types of Ku-band downlink transmissions. Section 25.212(c) of our rules provides that Ku-band earth stations meeting a minimum size limit may be routinely licensed if the downlink EIRP density does not exceed +6.0 dBW/4 kHz for digital transmissions and +13.0 dBW / 4 kHz for narrowband analog transmissions.²¹²

97. Hughes argues that, given that the most common transponder bandwidth for Ku-band satellites is 36 MHz, with a peak EIRP in the range from 49 to 52 dBW, the maximum EIRP spectral density for single-carrier full transponder and dual-carrier full transponder transmissions allowed for routine processing could be increased from +6 dBW/4kHz to +13.0 dBW/4kHz.²¹³ Spacenet recommends increasing the routine satellite downlink EIRP limit for wideband digital carriers from +6.0 to +16.0 dBW/4kHz.²¹⁴ Hughes responds that the power level proposed by Spacenet would create unacceptable levels of interference.²¹⁵ SIA supports increasing EIRP density to 13 dBW/4 kHz, but only if the higher EIRP is coordinated with adjacent satellite operators.²¹⁶

²¹⁰ See 47 C.F.R. § 25.212(c).

²¹¹ We reviewed the earth station licenses on file in our database. Based on that review, we found that, as of October 1, 2004, of the 1657 licensed emissions authorizing operations in the 14.0-14.5 GHz band, none were authorized analog audio operations using bandwidths of 360 kHz or less. Similarly, of the 2804 licensed emissions authorizing operations in the 11.7-12.2 GHz band, none were authorized analog audio operations using bandwidths of 360 kHz or less. On the other hand, 1146 licensed emissions, or 69.2 percent, in the 14.0-14.5 GHz band, and 1439 or 43.9 percent in the 11.7-12.2 GHz band, were for digital operations.

²¹² 47 C.F.R. § 25.212(c).

²¹³ Hughes Comments at 16-17; Hughes Reply at 7.

²¹⁴ Spacenet Comments at 30-34 and Exhibits B and C, *citing Ku-band NGSO Order*, 16 FCC Rcd 4096; Spacenet Reply at 14.

²¹⁵ Hughes Reply at 8.

²¹⁶ SIA Further Comments at 25-26.

98. *Discussion.* We find that we can increase the Ku-band downlink EIRP density limit, but not to the extent that the Hughes and Spacenet propose. No commenter provided a link budget analysis or any other detailed technical data to support their proposals. Furthermore, analyzing the proposal to increase EIRP density for transmissions to 13.0 dBW/4 kHz or higher using the available 1986 data shows that most narrowband analog transmissions are likely to experience harmful interference.²¹⁷

99. Nevertheless, we conclude that we can increase the Ku-band downlink EIRP density limit from its current +6 dBW/4 kHz to 10 dBW/4 kHz. Based on our analysis of the VSAT downlink EIRP density increase as set forth in Appendix C, we find that increasing the EIRP density limit to 10 dBW/4 kHz will not cause an increase in harmful interference to other licensed operators. We also adopt rule revisions needed to implement this proposal, as set forth in Appendix B.

c. C-band Earth Stations

100. Currently, the Commission's rules do not specify a downlink EIRP limit for C-band earth station operations. New Skies agrees that there is no need for an absolute limit, but recommends adopting downlink EIRP guidelines for the C-band. New Skies notes that data submitted by GE Americom in 1983 showed that the satellites then in operation would not cause harmful interference into adjacent satellite systems if all the satellites in operation used downlink EIRP levels at C-band within 2 dB of each other. New Skies recommends a study to determine whether greater power level differences among adjacent satellites are now possible.²¹⁸ Telesat replies that the Commission has not found any need to adopt downlink EIRP guidelines for the C-band in the past, and asserts that there is no need for such guidelines now.²¹⁹

101. We will not adopt C-band downlink EIRP requirements or guidelines at this time. The record does not provide a basis for adopting any specific requirements or guidelines. Furthermore, we are not aware of any instances of harmful interference at C-band that might have been prevented by adopting requirements or guidelines. If New Skies submits a petition for rulemaking proposing specific rule revisions or guidelines, and provides an engineering study to support its recommendation, we will consider revisiting our conclusion.

3. Earth Station Uplink Power Levels

102. *Background.* Another method of controlling interference in a two-degree spacing environment is to limit the uplink power from the earth station. Section 25.211 contains uplink power limits for routine processing of both C-band and Ku-band earth stations transmitting video and "full transponder" services.²²⁰ Section 25.212 governs certain other transmissions, including

²¹⁷ See Appendix C.

²¹⁸ New Skies Comments at 3-5.

²¹⁹ Telesat Reply at 2-3.

²²⁰ Section 25.211(d) reads as follows: "In the [conventional C-band], an earth station with an equivalent diameter of 9 meters or smaller may be routinely licensed for transmission to full transponder services if the maximum power into the antenna does not exceed 450 watts (26.5 dBW). In the [conventional Ku-band], an earth station with an equivalent diameter of 5 meters or smaller may be routinely licensed for transmission of full transponder services if the maximum power into the antenna does

various combinations of "wideband" and "narrowband" analog and digital services at both C-band and Ku-band.²²¹ In the *Notice*, the Commission focused on the definitions of "wideband," "narrowband," and "full transponder" in Sections 25.211 and 25.212.²²² While the Commission proposed definitions for these terms,²²³ it also invited commenters to discuss whether it was still appropriate to use these terms.²²⁴ In their initial comments, parties generally recommended defining "wideband" as carriers greater than 3 to 5 MHz.²²⁵

103. In its *ex parte* statements, however, SIA suggested more extensive revisions to the uplink power rules in Sections 25.211 and 25.212. SIA recommends applying the power limits in Section 25.211 to *analog* video transmissions only, and moving the limits for digital video into Section 25.212.²²⁶ Section 25.212 would then apply to all digital transmissions, and would apply a single power level to both narrowband and wideband digital transmissions.²²⁷ SIA also recommends eliminating definitions of "narrowband" and "wideband." It states that "narrowband" is defined wherever it appears in Section 25.212, and that its proposed consolidation of all digital transmissions in Section 25.212 make a definition of "wideband" unnecessary.²²⁸ In addition, SIA requests us to clarify that the input power density limits in Section 25.212 apply to the input power spectral density into the transmitting antenna flange.²²⁹

not exceed 500 watts (27 dBW)." 47 C.F.R. § 25.211(d).

²²¹ Section 25.212(c) states: "In the [conventional Ku-band], an earth station with an equivalent diameter of 1.2 meters or greater may be routinely licensed for transmission of narrowband analog services with bandwidths up to 200 kHz if the maximum input power density into the antenna does not exceed -8 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed 13 dBW/4 kHz, and for transmission of narrowband and/or wideband digital services, if the maximum input power density into the antenna does not exceed -14 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed +6.0 dBW/4 kHz." 47 C.F.R. § 25.212(c). Section 25.212(d) states: "In the [conventional C-band], an earth station with an equivalent diameter of 4.5 meters or greater may be routinely licensed for transmission of SCPC services if the maximum power densities into the antenna do not exceed +0.5 dBW/4 kHz for analog SCPC carriers with bandwidths up to 200 kHz, and do not exceed -2.7 dBW/4 kHz for narrow and/or wideband digital SCPC carriers." 47 C.F.R. § 25.212(d).

²²² *Notice*, 15 FCC Rcd at 25143 (para. 41). In addition to the uplink power limits in Sections 25.211 and 25.212, Section 25.134 includes routine power levels for digital and analog uplink Ku-band VSAT systems.

²²³ *Notice*, 15 FCC Rcd at 25185 (App. B, proposed Section 25.201(b)(41)).

²²⁴ *Notice*, 15 FCC Rcd at 25143 (para. 41).

²²⁵ *See Further Notice*, 17 FCC Rcd at 18634-35 (para. 134), and pleadings cited therein.

²²⁶ SIA December 10, 2001 *Ex Parte* Statement at 24, *cited in Further Notice*, 17 FCC Rcd at 18634 (para. 133).

²²⁷ SIA December 10, 2001 *Ex Parte* Statement at 24, *cited in Further Notice*, 17 FCC Rcd at 18634 (para. 133).

²²⁸ SIA December 10, 2001 *Ex Parte* Statement at 27. SIA also proposed revisions to Section 25.212 that parallel its proposed revisions to the standards for routine and non-routine earth station applications it proposed for Section 25.209. SIA December 10, 2001 *Ex Parte* Statement, App. at 16-17. We will address SIA's proposed revisions to Sections 25.209 and 25.212 in the *Sixth Report and Order* in this proceeding.

104. The Commission invited comment on SIA's proposals in the *Further Notice*.²³⁰ In particular, the Commission observed that it may be reasonable to treat analog video transmissions separately from other transmissions because those transmissions are more susceptible to harmful interference from other transmissions and more likely to cause harmful interference to other transmissions.²³¹ The Commission also asked for comment on whether it should define input power limits to the earth station antenna in terms of power spectral density into the antenna flange.²³²

105. *Discussion.* In its further comments, SIA continues to recommend that the power limits of Section 25.211 apply only to analog video transmissions, and that digital video transmissions be subject to the power limits of Section 25.212.²³³ No one else commented on this issue.

106. We agree with SIA that we should treat analog video transmissions separately from other transmissions, and that the appropriate powers are those contained in Section 25.211. As the Commission explained in the *Further Notice*, analog video transmissions should be treated separately from other transmissions because they are more susceptible to harmful interference from other transmissions and more likely to cause harmful interference to other transmissions.²³⁴ Moreover, while Sections 25.211(a) through (c) explicitly apply only to analog video transmissions, Section 25.211(d) applies to both digital and analog full transponder services. Accordingly, by amending Section 25.211(d) to make it explicit that it applies only to full transponder analog video services in the C-band or the Ku-band, we make our treatment of full transponder analog services consistent with other analog services, and our treatment of full transponder digital services consistent with other digital services. With respect to SIA's recommendation to make digital video transmissions subject to Section 25.212, we note that Sections 25.212(c) and (d) provide power limits for "narrowband and/or wideband digital

²²⁹ SIA December 10, 2001 *Ex Parte* Statement at 24, cited in *Further Notice*, 17 FCC Rcd at 18634 (para. 133). The antenna flange is the radiofrequency connector at the input to the antenna.

²³⁰ *Further Notice*, 17 FCC Rcd at 18635 (paras. 136-37).

²³¹ *Further Notice*, 17 FCC Rcd at 18635 (para. 136), citing Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Processing Procedures for Satellite Communications Services, *Second Report and Order and Further Notice of Proposed Rulemaking*, CC Docket No. 86-496, 8 FCC Rcd 1316, 1320 (para. 24) (1993) (*Ku-band Antenna Gain Pattern Revision Order*). In that Order, the Commission adopted revisions to several technical rules intended to help implement 2° orbital spacing, in addition to revising the Ku-band earth station antenna gain pattern. The Commission also sought comment on revising the temporary fixed earth station rules. We discuss that proposal in Section IV.C.3. When we refer to that part of the document, we will refer to it as the *Temporary-Fixed Further NPRM*.

²³² *Further Notice*, 17 FCC Rcd at 18635-36 (paras. 136-37). The antenna flange is the radio frequency connector at the input to the antenna.

²³³ SIA Further Comments at 24.

²³⁴ *Further Notice*, 17 FCC Rcd at 18635 (para. 136).

services" for the Ku-band and C-band, respectively.²³⁵ The wideband digital services referred to in Sections 25.212(c) and (d) include digital video transmissions, and so Section 25.212 already applies to digital video transmissions. Moreover, we agree with SIA that these revisions to Sections 25.211 and 25.212 make our proposed definitions for "narrowband" and "wideband" unnecessary, because the same power requirements will apply to both narrowband and wideband digital transmissions. Therefore, we need not address this issue further.

107. We also agree with SIA that the phrase "input power spectral density to the antenna flange" is more precise than the language currently in Section 25.212(c). The term "flange," however, implies a particular implementation hardware, which is very common, but not necessarily unique.²³⁶ Accordingly, we will not include the word "flange" in Section 25.212(c), and instead use the phrase "input power spectral density to the antenna." As a logical outgrowth of SIA's proposal, we also revise Section 25.134 to include the phrase "input power spectral density to the antenna" for VSAT systems.

4. Industry Working Group

108. GE Americom and SIA recommend allowing an industry working group to review all the Commission's current C-band and Ku-band earth station power limits, similar to the working group that developed Ka-band standards.²³⁷ Subsequently, SIA formed a working group that made several recommendations, including the increase in Ku-band downlink EIRP density we adopt above. The Industry is free to form an industry working group on a voluntary basis. However, we will not mandate the formation of any such group. If that working group develops recommendations for earth station power level revisions or guidelines, it may file a petition for rulemaking requesting the Commission to codify those revisions or guidelines. We will determine whether a rulemaking is warranted when or if such a petition is filed.

C. Temporary Fixed Earth Stations

1. Immediate Operation at Ku-band

109. In the *Notice*, we proposed allowing operators of "routine" temporary fixed earth stations in the Ku-band to begin operation immediately upon placement of the application on public notice, rather than waiting for license grant.²³⁸ "Routine" temporary fixed earth stations

²³⁵ 47 C.F.R. §§ 25.212(c), (d).

²³⁶ For example, small earth station antennas may use a coaxial cable connector, if the route between the amplifier and the antenna is relatively short and if there is power to spare. Also, broadband over satellite applications may use an integrated feed/amplifier module where the coupling of the amplifier to the antenna is internal to the module, is inaccessible from the outside, and may consist of a printed pattern on a ceramic chip. In this case, the connection to the feed/amplifier module would be through a coaxial connector, but the power level at this interface would not provide a direct measure of the antenna input power density.

²³⁷ GE Americom Comments at 3-4; SIA Reply at 2-4.

²³⁸ *Notice*, 15 FCC Rcd at 25143 (para. 42), 25181-82 (App. B, proposed Section 25.151(e)). The *Notice* limited this proposal to temporary fixed earth stations rather than all FSS earth stations. This limitation is reasonable because temporary fixed earth station operators are often newsgathering organizations that need to begin operations quickly.

are those intended to operate only in the conventional Ku-band and seeking authority to communicate only with U.S.-licensed satellites and non-U.S.-licensed satellites on the Permitted List, and that meet the antenna size and power limits in Part 25.²³⁹ We also suggested limiting this immediate operating authority to applications filed electronically.²⁴⁰ Finally, we tentatively concluded that Section 309(b)(2) of the Communications Act does not require a 30-day public notice period for this narrow class of temporary fixed earth station applications.²⁴¹

110. PanAmSat argues that the automatic authority should not take effect until after the 30-day notice period, so that any issues that may arise could be resolved before operations begin.²⁴² Spacenet, on the other hand, supports the Commission's proposal to allow routine temporary fixed earth stations to begin operation immediately upon public notice.²⁴³

111. We adopt the proposal in the *Notice*. "Routine" Ku-band temporary-fixed earth stations should not cause harmful interference into other satellite systems. Further, the band is allocated to the fixed-satellite service on a primary basis, which means that satellite services are protected against interference from other services. In the year ending October 1, 2004, no one filed any oppositions that persuaded us to deny any of the 27 routine Ku-band temporary-fixed earth station applications filed that year. Any earth station operator that causes harmful interference during this 30-day period may be subject to forfeiture penalties.²⁴⁴ In addition, if any objection is filed, we reserve the right to require the operator to terminate operations.²⁴⁵

2. Other Frequency Bands

112. We also invited proposals for streamlining applications for temporary fixed earth stations in frequency bands other than the conventional Ku-band.²⁴⁶ None of the commenters made any proposals. Accordingly, we limit these streamlined procedures to temporary-fixed conventional Ku-band applications as specified above.

²³⁹ *Notice*, 15 FCC Rcd at 25143 (para. 42), 25181-82 (App. B, proposed Section 25.151(e)). As noted above, the conventional Ku-band is the 14.0-14.5 GHz and 11.7-12.2 GHz band.

²⁴⁰ *Notice*, 15 FCC Rcd at 25143 (para. 42), 25181-82 (App. B, proposed Section 25.151(e)).

²⁴¹ *Notice*, 15 FCC Rcd at 25143 (para. 42), *citing* 47 U.S.C. § 309(b)(2).

²⁴² PanAmSat Comments at 11. *See also* SIA Reply at 6.

²⁴³ Spacenet Comments at 44.

²⁴⁴ *See* 47 C.F.R. § 25.273(a)(3) (no one may transmit in any manner that causes unacceptable interference to the authorized transmission of another licensee); 47 C.F.R. § 1.80(a)(2) (violators of Commission rules may be subject to forfeiture liability).

²⁴⁵ Section 25.277(e) of the Commission's rules, 47 C.F.R. § 25.277(e), requires temporary-fixed earth station operators to cease operations upon notification of harmful interference.

²⁴⁶ We emphasized that we were not contemplating revision of the process for coordinating temporary fixed earth stations and terrestrial operations in shared bands, but rather inviting proposals for streamlining the licensing of such earth stations once coordination was complete. *Notice*, 15 FCC Rcd at 25143 (para. 43).

3. Testing

113. In the *Temporary-Fixed Further NPRM*, the Commission invited comment on testing requirements for temporary-fixed earth stations.²⁴⁷ Interested parties filed comments in 1993. We find that the record on this issue is now stale. We find further that, in light of the subsequent operation of temporary-fixed earth stations since 1993 without reported cases of harmful interference, testing requirements have proven unnecessary. Accordingly, we decide not to adopt any testing requirements for temporary-fixed earth stations and terminate that proceeding.

D. Mobile Earth Station Networks

1. One-year Construction Completion Requirement

114. Section 25.133(a) of the Commission's rules requires each earth station licensee to complete construction of its earth station within one year of the date the license is granted.²⁴⁸ This includes all earth stations covered by a "blanket" earth station license. Rather than individually licensing each technically identical antenna operating as a network, the Commission often issues blanket licenses covering a specified number of earth stations. In the *Notice*, the Commission questioned whether it is necessary to require licensees holding blanket licenses for multiple satellite mobile earth station terminals (METs) to construct all the METs authorized within a year of the grant of the license, provided that a reasonable number of METs have been constructed and the licensee has started to offer service within a year.²⁴⁹ Therefore, we proposed revising Section 25.133(a) to require MET licensees only to bring their networks of earth stations into operation within a year, without specifying the number of stations required to be operational.²⁵⁰ We also proposed revising Section 25.133(b) of our rules to require MET licensees to certify that they have brought their networks into operation within a year of receiving their licenses.²⁵¹

115. Commenters generally support these proposals. Motient notes that most MET licensees request authority for enough METs to enable their businesses to grow for several years, and asserts that it is burdensome for licensees to construct all those terminals in the first year of the license term.²⁵² On the other hand, SIA questions whether there should be any requirements to bring any METs into use within a year.²⁵³ As proposed in the *Notice*, we revise Section

²⁴⁷ *Temporary-Fixed Further NPRM*, 8 FCC Rcd at 1325-27 (paras. 56-64).

²⁴⁸ 47 C.F.R. § 25.133(a), *cited in Notice*, 15 FCC Rcd at 25144 (para. 46).

²⁴⁹ *Notice*, 15 FCC Rcd at 25144 (para. 46), *citing 1996 Streamlining Order*, 11 FCC Rcd at 21592 (para. 26) (noting that the Commission had previously relaxed the requirement that VSAT operators construct their networks within four years).

²⁵⁰ *Notice*, 15 FCC Rcd at 25144 (para. 46).

²⁵¹ *Notice*, 15 FCC Rcd at 25144 (para. 46).

²⁵² Motient Comments at 3. *See also* Astrolink Comments at 5; CMDC Reply at 2.

²⁵³ SIA nevertheless agrees that the Commission's proposed rule is preferable to requiring that all METs covered by a blanket license be brought into use within a year. SIA March 23, 2004 *Ex Parte* Statement at 4.

25.133(a) to require MET licensees only to bring their networks of earth stations into operation within a year. We also revise Section 25.133(b) to require MET licensees to certify that they have brought their networks of earth stations into operation within a year of receiving their licenses. The Commission's rules prohibit licensees from taking their earth stations out of operation for more than 90 days.²⁵⁴ The rules also provide for eliminating protection from interference in cases where a licensee has used its station less than 50 percent of the time in any 12-month period.²⁵⁵ This furthers the public interest by encouraging licensees to provide the services they said they would provide in their license applications. For the same reason, we find that it is reasonable to require MET licensees to report to the Commission whether they have brought their networks into use within 12 months.

116. Astrolink recommends extending this relief to Ka-band blanket earth station licenses.²⁵⁶ In contrast to METs, Ka-band earth stations operate in the Fixed-Satellite Service. We conclude that it is similarly burdensome to require Ka-band blanket earth station licensees to construct all the licensed terminals in the first year of the license term. For the same reason, we include Ku-band blanket earth station licenses, including VSAT licenses. We revise Sections 25.133(a) and (b) accordingly.

2. Bring-Into-Use Requirements

117. *Background.* In the Notice, the Commission also invited comment on whether MET licensees should be required to bring a certain percentage of their authorized terminals into use within a certain time after they receive their licenses. The Commission also asked what percentage would be reasonable, and what time period would be appropriate.²⁵⁷

118. *Discussion.* Globalstar opposes any requirement to bring a certain percentage of terminals into use by a certain time. Globalstar and CMDC criticize the Commission for not proposing any specific milestone schedule in the Notice.²⁵⁸ Astrolink argues that MET licensees should be allowed to bring terminals into use in response to marketplace forces rather than a Commission-imposed milestone schedule.²⁵⁹ Globalstar also argues that marketing considerations may justify postponement of the rollout of a particular MET.²⁶⁰ The number of terminals that a MET licensee is authorized to build does not affect other licensees' ability to implement their systems. Thus, there are no warehousing issues. Therefore, we agree that MET

²⁵⁴ 47 C.F.R. § 25.161(c).

²⁵⁵ 47 C.F.R. § 25.162(c).

²⁵⁶ Astrolink Comments at 5-6. *See also* Hughes Reply at 18-19 (arguing that the Commission allowed Ka-band blanket earth station licensees to build out their systems over the life of the license when it decided to make the terms of such blanket licenses coincide with space station licenses, and requesting clarification of this issue); SIA Reply at 11.

²⁵⁷ Notice, 15 FCC Rcd at 25144 (para. 47).

²⁵⁸ Globalstar Comments at 5; CMDC Reply at 2-3. *See also* SIA Reply at 10-11.

²⁵⁹ Astrolink Comments at 8. *See also* SIA March 23, 2004 *Ex Parte* Statement at 4-5.

²⁶⁰ Globalstar Comments at 4.

licensees should be allowed to bring terminals into use in response to marketplace forces rather than a Commission-imposed milestone schedule.

3. Terminal Reporting Requirement

119. The *Notice* invited interested parties to discuss whether there is any need to review the number of mobile earth station terminals brought into operation at various points in the license term.²⁶¹ For example, should MET licensees be required to file periodic reports stating the number of terminals in use?²⁶²

120. Astrolink and CMDC argue that reporting requirements are not necessary because METs use exclusive satellite spectrum, and operate with an individual satellite under strict service rules, and so the number of METs in operation does not affect the interference environment or intra-system sharing.²⁶³ Globalstar and Astrolink oppose a periodic reporting requirement, claiming that the number of terminals in use is competitively sensitive.²⁶⁴ We agree that such MET reporting requirements are unnecessary.²⁶⁵

121. Astrolink requests us to eliminate the annual Ka-band earth station reporting requirement in Section 25.145(g)(2).²⁶⁶ We will not eliminate this reporting requirement for Ka-band licensees at this time. Section 25.145(g)(2) requires Ka-band earth station blanket license holders to report the number of earth stations brought into service, so that the Commission can monitor the development of the service.²⁶⁷ The Commission anticipated streamlining this procedure at some point in the future, once the service has matured sufficiently that monitoring

²⁶¹ *Notice*, 15 FCC Rcd at 25144 (para. 47).

²⁶² *Notice*, 15 FCC Rcd at 25144 (para. 47).

²⁶³ Astrolink Comments at 7; CMDC Reply at 3. *See also* SIA Reply at 8-9; SIA March 23, 2004 *Ex Parte* Statement at 4-5.

²⁶⁴ Globalstar Comments at 5; Astrolink Comments at 7. *See also* SIA Reply at 10-11.

²⁶⁵ We also note that the Commission relaxed a MET reporting requirement in the *ATC Reconsideration Order*. *See* Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, *Memorandum Opinion and Order and Second Order and Reconsideration*, IB Docket No. 01-185, FCC 05-30 at para. 49 (released Feb. 25, 2005).

²⁶⁶ Astrolink Comments at 7. Astrolink alternatively requests that we allow licensees to submit that information on a confidential basis. Astrolink Comments at 7. Licensees are always allowed to submit information under a request for confidentiality under Section 0.459 of the Commission's rules, 47 C.F.R. § 0.459. In the event that a licensee files such a request, we would evaluate it at the time a party files a request to inspect that information under the Freedom of Information Act (FOIA) and Section 0.461 of the Commission's rules, 47 C.F.R. § 0.461.

²⁶⁷ *18 GHz Band Report and Order*, 15 FCC Rcd at 13472 (para. 88).

growth on an annual basis is no longer necessary,²⁶⁸ but there is nothing in the record to show that this service has reached that level of maturity.

4. License Renewals

122. The Commission solicited comment on renewing blanket MET and VSAT licenses only for those earth stations that have been brought into operation if the licensee has not brought all the earth stations permitted by its license into operation at the time of renewal.²⁶⁹ Globalstar and Motient oppose this as a restriction on the flexibility of MET licenses.²⁷⁰ Globalstar and Astrolink argue that, under this proposal, the licensee would have to file an amendment as soon as it wanted to add another terminal to its network.²⁷¹ Hughes asserts that this requirement is burdensome and unnecessary for VSAT licensees.²⁷² We agree that it could be unnecessarily burdensome to limit renewals for blanket licensees in this way, and will not adopt this proposal.

5. Other MET Issues

123. Globalstar requests us to clarify that METs are distinct from the NGSO MSS service provider's gateway earth station network, and that multiple entities may obtain separate MET authorizations with the same MSS satellite system.²⁷³ SIA requests that we clarify that the term "network" in the context of the MET issues we discuss above means the METs authorized under the blanket license rather than a combination of those METs and space stations or gateway earth stations.²⁷⁴ Both SIA and Globalstar are correct. The rule revisions we adopt here apply only to the METs themselves, and not to the satellites communicating with those METs, or to gateway earth stations.

V. VSAT LICENSING ISSUES

A. Background

124. The Commission's rules permit parties to obtain a license for a large number of technically identical small aperture antenna earth stations. These networks are referred to as very small antenna terminal (VSAT) networks. VSATs are generally comprised of a hub station transmitting to a satellite, which then transmits the signal to multiple technically identical remote small aperture antennas.²⁷⁵ The remote antennas can also transmit to the satellite, which then

²⁶⁸ *18 GHz Band Report and Order*, 15 FCC Rcd at 13472 n.178.

²⁶⁹ *Notice*, 15 FCC Rcd at 25144 (para. 46).

²⁷⁰ Motient Comments at 4; Globalstar Comments at 4.

²⁷¹ Astrolink Comments at 6-7; Globalstar Comments at 4-5. *See also* CMDC Reply at 2; SIA Reply at 9-10.

²⁷² Hughes Comments at 28. *See also* SIA Reply at 16-17; Spacenet Reply at 23-25, SIA December 10, 2001 *Ex Parte* Statement at 31-32; ; SIA March 23, 2004 *Ex Parte* Statement at 5-6.

²⁷³ Globalstar Comments at 3-4.

²⁷⁴ SIA Reply at 7 n.15.

²⁷⁵ *Notice*, 15 FCC Rcd at 25145 (para. 50), *citing* Routine Licensing of Large Networks of

retransmits the signal to the hub station. In many networks, the hub earth station controls the remote earth stations. VSAT networks were originally permitted only in the Ku-band,²⁷⁶ but have since been allowed in the C-band and Ka-band.²⁷⁷ The Commission solicited comment on a number of VSAT issues in the *Notice* and the *Further Notice*.²⁷⁸ We address those issues below.

B. Multiple Hub Stations

125. In the *Notice*, we proposed revising Section 25.134 so that it explicitly permits multiple hub stations under a single VSAT network license.²⁷⁹ We noted that a second hub station could be used as a backup to the primary hub station.²⁸⁰ We also observed that multiple hub stations could promote provision of Internet service, by allowing distribution of network traffic to various traffic switching and control centers.²⁸¹ WorldCom and Spacenet support this proposal,²⁸² and no one opposed it. Accordingly, we revise Section 25.134 to allow multiple hub stations under a single VSAT network license, for all the reasons set forth in the *Notice*.²⁸³

126. The National Radio Astronomy Observatory (NRAO), however, recommends placing a limitation on multiple-hub VSAT networks. NRAO observes that Section 25.203(f) establishes a "Quiet Zone" for radio astronomy in a 13,000 square mile area in Virginia, West Virginia, and Maryland.²⁸⁴ Under Section 25.203(f), anyone seeking a license in that area must notify the NRAO.²⁸⁵ NRAO is given 20 days to file an objection to the proposed operations with

Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, 51 Fed. Reg. 15067 (Apr. 22, 1986) (*1986 VSAT Order*); 47 C.F.R. §25.134(a).

²⁷⁶ See *Notice*, 15 FCC Rcd at 25145 (para. 50).

²⁷⁷ See FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service that Share Terrestrial Spectrum, *First Report and Order*, IB Docket No. 00-203, 16 FCC Rcd 11511 (2001) (*FWCC/Onsat First Report and Order*). Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, *Report and Order*, IB Docket No. 98-172, 15 FCC Rcd 13430 (2000).

²⁷⁸ *Notice*, 15 FCC Rcd at 25148-50 (paras. 58-66); *Further Notice*, 17 FCC Rcd at 18622 (paras. 98-100).

²⁷⁹ *Notice*, 15 FCC Rcd at 25148 (paras. 58-59).

²⁸⁰ *Notice*, 15 FCC Rcd at 25148 (para. 58).

²⁸¹ *Notice*, 15 FCC Rcd at 25148 (para. 58).

²⁸² WorldCom Comments at 3; Spacenet Comments at 46. See also PanAmSat Comments at 11 (PanAmSat supports the proposal, provided that the location and operating parameters of all the hubs are specified in the application); SIA Reply at 17.

²⁸³ *Notice*, 15 FCC Rcd at 25148 (para. 58).

²⁸⁴ The Quiet Zone is an area bounded by 39° 15' N.L., 78° 30' W.L., 37° 30' N.L., and 80° W.L. See 47 C.F.R. § 25.203(f).

²⁸⁵ NRAO Reply at 1-2, citing 47 C.F.R. § 25.203(f); Amendment of Part 2 of the

the Commission. If NRAO files an objection, Section 25.203(f) states that the Commission may take whatever action it deems appropriate.²⁸⁶ NRAO requests that we adopt coordination procedures to ensure that VSAT systems that are authorized to add hubs or remotes to their system without filing an additional application continue to protect NRAO's radio astronomy operations in the Quiet Zone, and proposes an amendment to Section 25.203(f).²⁸⁷

127. The Commission did not propose revisions to any of its rules governing VSAT remote earth stations, in effect since the 1980s, or the Quiet Zone notification requirement in effect since 1958. Thus, with respect to hub earth stations, this Order does not allow VSAT licensees to add hubs to their networks without filing a modification application specifying the location and the operating parameters of those hubs. Further, with regard to the request that we place a new coordination requirement on VSAT remote terminals, we believe that such a request is beyond the scope of the *Notice* and *Further Notice* in this proceeding. Accordingly, we will invite interested parties to comment on NRAO's proposal in the upcoming *Third Further Notice* in this proceeding. In view of the foregoing, we conclude that no revisions to Section 25.203(f) are warranted at this time.

C. Temporary Fixed VSAT Stations

128. *Background.* The *Notice* invited comment on whether to license temporary-fixed earth stations under VSAT network blanket licenses, either as hubs or as remote earth stations.²⁸⁸ A temporary-fixed or transportable earth station is one that can be transported from place to place, but operates only when stationary. Satellite news-gathering trucks are the most common type of temporary-fixed earth stations. This proposal was limited to temporary-fixed systems operating in the Ku-band because temporary-fixed stations in the C-band, which is allocated on a co-primary basis to both the fixed-satellite and terrestrial services, might raise potentially complex coordination issues.²⁸⁹ The *Notice* also invited comment on extending the technical requirements for VSAT hubs currently in our rules to temporary fixed VSAT hubs.²⁹⁰

129. *Discussion.* PanAmSat does not object to this proposal, provided that temporary-fixed VSAT hubs are required to comply with all Part 25 requirements.²⁹¹ Spacenet and Hughes

Commission's Rules and Regulations to Give Interference Protection to Frequencies Utilized for Radio Astronomy, Amendment of Part 3, 4, 5, 6, 7, 9, 10, 11, 16, 20, and 21 of the Commission's Rules and Regulations to Give Interference Protection to Frequencies Utilized for Radio Astronomy, *Report and Order*, Docket No. 11745, FCC 58-1111, 17 Rad. Reg. 1738 (1958) (*Quiet Zone Order*).

²⁸⁶ 47 C.F.R. § 25.203(f).

²⁸⁷ NRAO Reply at 2-3.

²⁸⁸ *Notice*, 15 FCC Rcd at 25148 (para. 60).

²⁸⁹ *Notice*, 15 FCC Rcd at 25148-49 (paras. 61-62). At the time of the *Notice*, the Commission had proposed rules allowing VSAT-like systems operating in the C-band, called "CSATs." The Commission has since adopted such rules. See *FWCC/Onsat First Report and Order*, 16 FCC Rcd 11511.

²⁹⁰ *Notice*, 15 FCC Rcd at 25148 (para. 61), citing 47 C.F.R. § 25.134(a), (b).

²⁹¹ PanAmSat Comments at 12.

also support this proposal.²⁹² Accordingly, we revise Section 25.277 to allow temporary-fixed Ku-band VSAT stations. We will impose the same fees on applications for temporary-fixed VSAT hubs and remote terminals as we currently apply to other VSAT hub and remote terminal license applications.²⁹³

130. Hughes, however, raises two issues with respect to temporary-fixed earth stations in VSAT networks. First, Hughes contends that the requirement in Section 25.277(e) of our rules that temporary-fixed earth stations cease operations immediately upon report of harmful interference should be limited to C-band earth stations.²⁹⁴ Second, Hughes asserts that it is inconsistent with precedent to require VSAT applicants to specify the number of temporary-fixed remote terminals they plan to have in their networks.²⁹⁵ As explained further below, Hughes is mistaken regarding both issues.

131. Hughes claims that Section 25.277(e) is based on a 1981 Order in which Western Tele-Communications, Inc. (WTCI) was granted a developmental authorization for temporary-fixed earth stations in the C-band, without a coordination requirement, but on a non-interference basis.²⁹⁶ Because the Ku-band is not shared on a co-primary basis with terrestrial operations as is the C-band, Hughes argues that Ku-band temporary-fixed earth stations should not be required to operate on a non-interference basis.²⁹⁷ When the Commission proposed rules for licensing temporary-fixed earth stations on a regular basis, however, it was concerned that such operations could cause adjacent satellite interference if the earth stations are poorly aligned.²⁹⁸ Therefore, the Commission proposed requiring all temporary-fixed earth stations to operate on a non-interference basis, in addition to requiring C-band temporary-fixed earth stations to coordinate with terrestrial wireless operations.²⁹⁹ The Commission later noted that the commenters supported these rules, and adopted them without extensive further discussion.³⁰⁰ Thus, we will continue to apply a non-interference requirement to Ku-band temporary-fixed earth stations.

²⁹² Spacenet Comments at 44; Hughes December 21, 2001 *Ex Parte* Statement at 1-2. *See also* SIA Reply at 17.

²⁹³ *See* 47 C.F.R. § 1.1107.

²⁹⁴ Hughes December 21, 2001 *Ex Parte* Statement at 2, *citing* 47 C.F.R. § 25.277(e).

²⁹⁵ Hughes December 21, 2001 *Ex Parte* Statement at 3.

²⁹⁶ Hughes December 21, 2001 *Ex Parte* Statement at 2, *citing* Western Tele-Communications, Inc., Mimeo No. 3640 (released Sept. 30, 1981).

²⁹⁷ Hughes December 21, 2001 *Ex Parte* Statement at 2.

²⁹⁸ Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Procedures for Satellite Communication Services, *Notice of Proposed Rulemaking*, CC Docket No. 86-496, 2 FCC Rcd 762, 765 (para. 34) (1986) (*Temporary-Fixed NPRM*).

²⁹⁹ *See Temporary-Fixed NPRM*, 2 FCC Rcd at 788, proposed Sections 25.307(d) and (e). Proposed Section 25.307(d) required coordination with all affected terrestrial licensees, and Section 25.307(e) required that temporary-fixed earth stations operate on a non-interference basis.

³⁰⁰ Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application

132. In addition, Hughes observes that earth stations in place for less than six months are permitted but not required to be licensed as temporary-fixed earth stations.³⁰¹ Hughes further maintains that requiring VSAT applicants to specify the number of temporary-fixed earth stations in their VSAT networks is inconsistent with that flexibility.³⁰² We disagree. Currently, earth station applicants are free to apply for either a regular FSS earth station license or a temporary-fixed earth station license when they plan to keep their earth station in place for six months or less. By requiring VSAT licensees to state in their applications the number of earth stations in their networks to be licensed as temporary-fixed earth stations, we are simply treating them consistently with other VSAT licensees.

D. VSAT Hub EIRP Limit

133. *Background.* In the *Further Notice*, the Commission observed that several commenters had recommended interpreting the EIRP limit of 78.3 dBW for VSAT hubs in Sections 25.134(a) and (b) of the Commission's rules as a per-carrier limit rather than an aggregate limit of all carriers.³⁰³ The Commission explained that it had considered and rejected earlier requests to interpret this as a per-carrier limit.³⁰⁴ The Commission explained further that, when it adopted this EIRP limit, in 1986, it determined that an aggregate EIRP limit higher than 78.3 dBW could cause unacceptable interference.³⁰⁵

134. Although the Commission recognized in the *Further Notice* that it might be reasonable to increase the hub EIRP limit to reflect new technology, it also found that none of the commenters had provided a sufficient basis for doing so.³⁰⁶ Therefore, the Commission invited

Procedures for Satellite Communication Services, *Second Report and Order and Further Notice of Proposed Rulemaking*, CC Docket No. 86-496, 8 FCC Rcd 1316, 1324 (para. 51) (1993) (*Temporary-Fixed Further NPRM*). These rule sections were renumbered from Sections 25.301(d) and (e) to Sections 25.277(d) and (e), respectively, but otherwise adopted as proposed.

³⁰¹ Hughes December 21, 2001 *Ex Parte* Statement at 3, *citing* Maritime Telecommunications Network, Inc., *Order*, 15 FCC Rcd 23210, 23220 (paras. 24-25) (Int'l Bur., 2000) (*MTN Order*). An earth station may be licensed as a temporary-fixed earth station if it will remain at a given location for six months or less. 47 C.F.R. § 25.277(a). However, the license term of a temporary-fixed earth station is the same as term for other earth stations; 15 years. 47 C.F.R. § 25.121.

³⁰² Hughes December 21, 2001 *Ex Parte* Statement at 3.

³⁰³ *Further Notice*, 17 FCC Rcd at 18628 (para. 119), *citing* SIA December 10, 2001 *Ex Parte* Statement at 30; Hughes Comments at 27; Spacenet Reply at 14.

³⁰⁴ *Further Notice*, 17 FCC Rcd at 18628 (para. 120), *citing* Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581, 21593 (para. 29) (1996) (*1996 Streamlining Order*).

³⁰⁵ *See* Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Notice of Proposed Rulemaking*, IB Docket No. 95-117, 10 FCC Rcd 10624, 10628 n.26, *citing* Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, *Declaratory Order*, 1986 WL 291567, at para. 14 (Com. Car. Bur., released Apr. 9, 1986), *summarized at* 51 Fed. Reg. 15067 (Apr. 22, 1986) (*1986 VSAT Order*).

³⁰⁶ *Further Notice*, 17 FCC Rcd at 18628-29 (para. 120).

interested parties to provide additional information demonstrating with particularity that a per-carrier 78.3 dBW EIRP limit would not cause unacceptable interference.³⁰⁷

135. *Discussion.* SIA observes that, when the Commission adopted the aggregate 78.3 dBW EIRP hub limit in 1986, it assumed that the hub was accessing only a single transponder under clear sky conditions.³⁰⁸ SIA argues further that a VSAT operator can now access multiple transponders from a single antenna.³⁰⁹ In those cases, according to SIA, the per-carrier input power spectral density limit of -14.0 dBW/4 kHz currently in Section 25.134 is a tighter limit than the aggregate EIRP hub limit of 78.3 dBW, and that, therefore, the 78.3 dBW limit is unnecessary and possibly confusing.³¹⁰ Similarly, Spacenet also maintains that the off-axis antenna gain performance standards in Section 25.209 and the input power spectral density standards in Sections 25.134 and 25.212 are sufficient to define the interference environment, and that treating the 78.3 dBW limit as a per carrier limit would not affect this environment.³¹¹

136. We find SIA's and Spacenet's arguments to be persuasive. Unlike 1986, when the 78.3 dBW hub limit was adopted, VSAT operators can now access multiple transponders from a single earth station antenna. Such operators must comply with the -14.0 dBW/4 kHz input power density currently in Section 25.134, which applies to all transmissions,³¹² and that limit makes the 78.3 dBW aggregate EIRP limit superfluous. Therefore, we will eliminate this aggregate limit from Section 25.134, and rely only on the -14.0 dBW/4 kHz input power density limit.

E. Non-U.S.-Licensed Satellites and International VSAT Networks

137. *Background.* In the *Notice*, the Commission observed that Section 25.115(c) limits conventional Ku-band VSAT networks to domestic service.³¹³ We also pointed out that this limitation is inconsistent with our *DISCO I* policy of permitting all U.S.-licensed fixed satellite systems to offer both domestic and international services,³¹⁴ and our *DISCO II* policy of allowing non-U.S.-licensed satellites to provide both domestic and international services in the United States.³¹⁵ Accordingly, we proposed revising Section 25.115(c) to allow applicants to apply for

³⁰⁷ *Further Notice*, 17 FCC Rcd at 18629 (para. 120).

³⁰⁸ SIA Further Comments at 22. *See 1986 VSAT Order* at para. 14.

³⁰⁹ SIA Further Comments at 22.

³¹⁰ SIA Further Comments at 22.

³¹¹ Spacenet Further Comments at 21-22.

³¹² 47 C.F.R. § 25.134(a)(1).

³¹³ *Notice*, 15 FCC Rcd at 25149 (para. 63), *citing* 47 C.F.R. § 25.115(c).

³¹⁴ *Notice*, 15 FCC Rcd at 25149 (para. 63), *citing* Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems, *Report and Order*, IB Docket No. 95-41, 11 FCC Rcd 2429 (1996) (*DISCO I*). International service is service to or from points in the United States from or to points outside of the United States.

³¹⁵ *Notice*, 15 FCC Rcd at 25149 (para. 63), *citing DISCO II*, 12 FCC Rcd 24094.

licenses for Ku-band VSAT networks for both domestic and international services, and to access both U.S.-licensed and non-U.S.-licensed satellites.³¹⁶

138. *Discussion.* Spacenet supports this proposal.³¹⁷ No one opposed it. Accordingly, we revise Section 25.115(c) as proposed.³¹⁸ Also as proposed in the *Notice*, VSAT network operators providing international service to and from the United States must comply with the power limitations and licensing procedure set forth in Section 25.134.³¹⁹ In addition, VSAT operators communicating with non-U.S.-licensed satellites will be required to comply with any conditions placed on the satellites' entry into the U.S. market.³²⁰ We will license only those VSAT facilities located in the United States.³²¹ VSAT network facilities in other nations, and the space stations with which they communicate, would be required to comply with the licensing requirements, if any, of the nations where they are located.³²²

139. Finally, we emphasize that Section 25.271 of the Commission's rules require all satellite and earth station licensees to be able to shut off immediately upon notification of harmful interference.³²³ Accordingly, we must place certain requirements on international VSAT system operators to ensure that they can comply with this requirement. Specifically, we require international VSAT system operators to maintain a control point within the United States, or to maintain a point of contact within the United States available 24 hours a day, 7 days a week, with the ability to shut off any earth station within the VSAT network immediately upon notification of harmful interference. We will not license international VSAT system operators that do not meet these requirements unless we require the VSAT network to be operated on a non-interference basis as a condition on the license, and the operator informs the Commission of all

³¹⁶ *Notice*, 15 FCC Rcd at 25149 (para. 64).

³¹⁷ Spacenet Comments at 46. *See also* SIA Reply at 17-18.

³¹⁸ *See Notice*, 15 FCC Rcd at 25149 (para. 64).

³¹⁹ *See Notice*, 15 FCC Rcd at 25149 (para. 64).

³²⁰ For example, one way of authorizing a non-U.S.-licensed satellite to enter the U.S. market is to place the satellite on the Permitted List. The Permitted List also includes conditions with which earth stations must comply when communicating with non-U.S.-licensed satellites on the Permitted List. For instance, pursuant to the World Trade Organization (WTO) Agreement on Basic Telecommunications Services (WTO Basic Telecom Agreement), the United States made market access commitments for fixed satellite services, but did not make market access commitments for DBS, Direct-to-Home (DTH) service, and Digital Audio Radio Service (DARS), and took a most favored nation (MFN) exemption for these services as well. We generally preclude non-U.S.-licensed satellite operators on the Permitted List from providing these services in the United States under this exemption. To obtain access to the U.S. market without these conditions, the non-U.S.-licensed satellite operator would have to submit an additional ECO-SAT analysis with respect to DBS, DTH, and DARS. For more on the ECO-SAT test, see *DISCO II*, 12 FCC Rcd at 24112-13 (para. 40).

³²¹ *See Notice*, 15 FCC Rcd at 25149 (para. 64).

³²² *See Notice*, 15 FCC Rcd at 25149 (para. 64).

³²³ 47 C.F.R. § 25.271(c)(3).

the VSAT terminals within the United States. We amend Section 25.271 to make these requirements clear.³²⁴

F. VSAT Licenses for Organizations with Multiple Members

140. The *Notice* invited comment on a proposal to establish VSAT-style blanket licensing for earth station networks, such as the Alaska Bush network or the National Public Radio (NPR) network, in which there are several individual earth station licensees that each belong to the same organization.³²⁵ While the Commission did not anticipate that this proposal would raise any technical issues, it found that it might need to resolve legal issues regarding the entity responsible for complying with Commission rules before instituting such a procedure.³²⁶ No one commented on this proposal, or indicated how we might resolve the inherent legal issues. Accordingly, we are not in a position to change our policy of licensing each earth station in a network made up of multiple members at this time.

VI. MISCELLANEOUS

A. Elliptical Earth Station Antennas

141. *Background.* In the *Notice*, the Commission proposed adding a number of definitions to Section 25.201 of the rules, including "equivalent antenna diameter."³²⁷ Instead of adopting this definition, however, SIA recommends revising Sections 25.211 and 25.212 to prescribe earth station power limits based on the antenna's "dimension parallel to the GSO plane"³²⁸ rather than "equivalent antenna diameter." Thus, SIA is implicitly recommending that we base our review of elliptical antennas exclusively on the length of the major axis rather than

³²⁴ These requirements are also consistent with the ESV rules for adopted in the *ESV Order*. *ESV Order* at para. 50.

³²⁵ *Notice*, 15 FCC Rcd at 25149-50 (para. 65). The Alaska Bush network is a large network of technically similar earth stations that provide digital telephony to many remote villages in Alaska. The NPR network is a large network of technically similar earth stations that provide for the collection and distribution of broadcast quality analog audio programming. The individual earth stations operating in the network are licensed to the various radio stations and universities that comprise the NPR network.

³²⁶ The Commission stated that this approach would be feasible only if it could place responsibility for complying with Commission rules on the umbrella organization holding the blanket license rather than individual members of the organization, but noted that we have recently adopted similar rules for Guard Band Managers, who were licensed to lease spectrum in the 700 MHz band to terrestrial wireless operators. *Notice*, 15 FCC Rcd at 25150 (para. 65), *citing* Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Second Report and Order*, WT Docket No. 99-168, 15 FCC Rcd 5299 (2000).

³²⁷ *See Notice*, 15 FCC Rcd at 25183 (App. B, Section 25.201(b)(7)). In the *Notice*, the Commission proposed defining the equivalent diameter for a rectangular aperture antenna with length, l , and width, w , to be $[(l \times w)/\pi]^{1/2}$. *Notice*, 15 FCC Rcd at 25183 (App. B, Section 25.201(b)(7)). In Appendix B to this *Order*, we correct this definition to read $[4(l \times w)/\pi]^{1/2}$.

³²⁸ When viewed from any point on the earth's surface, satellites near each other in the GSO appear to lie approximately in one plane. The antenna gain pattern equation in Section 25.209(a)(1) applies to side lobes within that GSO orbital plane.

its surface area.³²⁹ According to SIA, a Ku-band elliptical antenna with an equivalent antenna diameter of 1.0 meters often has better side lobe gain performance than a circular 1.2 meter antenna.³³⁰ No one else commented on these issues.

142. *Discussion.* We will not adopt SIA's proposal. Section 25.209 has antenna gain contour requirements both within the GSO orbital plane and outside that plane. This is because emissions in side lobes outside the GSO orbital plane have the potential to cause harmful interference to NGSO satellite systems. SIA's proposal would eliminate any size requirements for elliptical earth station antennas outside of the GSO orbital plane. We will not adopt a rule that could lead to an unlimited increase in the risk of harmful interference to NGSO satellite systems.³³¹ Accordingly, we will adopt a definition of "equivalent antenna diameter" in Part 25 of our rules, as the Commission proposed in the *Notice*.

B. Station Keeping and Interleaved Satellites

143. *Background.* In the *Notice*, the Commission cited two issues that might weigh against adopting a streamlined procedure for smaller-than-routine earth station applications. The first issue was whether such a procedure might result in an increase in harmful interference to satellites that drift too far away from their assigned orbit location, in violation of the Commission's station-keeping requirements.³³² The second was whether the procedure might adversely affect two-degree-compliant U.S.-licensed satellites that are interleaved with non-U.S.-licensed satellites providing service to South America.³³³ The Commission tentatively concluded, however, that neither of these issues warranted rejection of its proposed streamlined non-routine earth station procedures, and invited comment.³³⁴

144. *Discussion.* Parties filing comments in response to the *Notice* did not address these issues directly, however. Instead, commenters who proposed starting the antenna gain pattern at a greater off-axis angle argued that neither the station-keeping nor the interleaved-satellite issue

³²⁹ SIA December 10, 2001 *Ex Parte* Statement at 24, cited in *Further Notice*, 17 FCC Rcd at 18634 (para. 133).

³³⁰ SIA Further Comments at 25. SIA also corrects a typographical error in the last equation for equivalent diameter. SIA Further Comments at 24-25.

³³¹ In the Ku-band, NGSO FSS satellite systems are required to accept interference from GSO FSS systems. See *Ku-band NGSO Order*, 16 FCC Rcd at 4128 (para. 73). However, in that Order, the Commission also noted that it is beneficial to NGSO FSS systems to limit the signal energy radiated by GSO FSS earth stations, thereby placing an upper bound on the level of uplink interference that they must tolerate. *Ku-band NGSO Order*, 16 FCC Rcd at 4185-86 (para. 237). In that Order, the Commission also concluded that the the Part 25 rules adequately limit the interference that NGSO operators must accept. *Ku-band NGSO Order*, 16 FCC Rcd at 4185-86 (para. 237). Because SIA's proposal would eliminate any size requirements for elliptical earth station antennas outside of the GSO orbital plane, we will not adopt this proposal at this time. However, in the *Sixth Report and Order*, we relax the earth station antenna gain requirements within 3° of the GSO orbital arc. See *Sixth Report and Order* at para. 38.

³³² *Notice*, 15 FCC Rcd at 25138 (para. 27), citing 47 C.F.R. § 25.210(j)(1).

³³³ *Notice*, 15 FCC Rcd at 25138-39 (paras. 28-29).

³³⁴ *Notice*, 15 FCC Rcd at 25138-39 (paras. 27-29).

justify rejection of those proposals. The Commission reviewed those comments in the *Further Notice*,³³⁵ and tentatively agreed.³³⁶ The Commission again invited comment on its analysis in the *Further Notice*.³³⁷ In response, SIA agrees with the Commission that neither the possibility of failure to maintain station-keeping tolerances nor interleaved satellites warrant consideration when deciding whether to revise the earth station antenna gain envelope.³³⁸ Consequently, we find that these issues do not by themselves warrant rejection of any revisions to the antenna gain pattern envelope proposed in this proceeding. Accordingly, we will not address these issues further when we consider antenna gain pattern issues in a future Order.³³⁹

145. As an alternative proposal, Spacenet suggests creating a sub-classification of ALSAT earth station license that would authorize the earth station to communicate only with satellites that are at least two degrees away from adjacent satellites.³⁴⁰ We find that this is unnecessary. Section 25.210(j)(1) requires GSO satellites to be able to remain within 0.05° of their assigned orbital locations.³⁴¹ Satellites that meet this requirement should not experience any increase in unacceptable interference as a result of the changes in antenna gain patterns adopted here. Satellites that do not meet this requirement are in violation of a Commission rule and are not able to enjoy the same protection from interference as satellites that comply with our rules. Moreover, interleaved satellites are not likely to cause interference into each other's systems provided that they maintain the proper geographic spatial isolation. Further, we would not allow an interleaved non-U.S.-licensed satellite less than 2° away from a U.S. satellite authorized to serve the United States to obtain "ALSAT" status, since doing so would cause harmful interference to U.S. operations. Therefore, we will not separately classify the satellites that routine earth stations in the conventional C-band and Ku-band can access, as Spacenet suggests.

C. Radiation Hazards from Co-located Antennas

146. In the *Notice*, the Commission observed that the National Environmental Policy Act of 1969 (NEPA) requires agencies of the Federal Government to evaluate the effects of their actions on the quality of the human environment.³⁴² To satisfy in part its responsibilities under

³³⁵ *Further Notice*, 17 FCC Rcd at 10777-78 (paras. 33-34).

³³⁶ *Further Notice*, 17 FCC Rcd at 10778 (para. 36).

³³⁷ *Further Notice*, 17 FCC Rcd at 10778 (para. 36).

³³⁸ SIA Further Comments at 8. *See also* Spacenet Further Comments, Att. A at 23-25.

³³⁹ The 0.05° on both sides of an assigned nominal orbit location is often referred to as the "stationkeeping box." On occasion, when the Commission has authorized two or satellite licensees to collocate their satellites at a particular orbital location, one of those licensees were required to operate its satellite outside the stationkeeping box. In these cases, it has been determined that that particular satellite can be allowed to operate outside the stationkeeping box without causing harmful interference to other two-degree-compliant satellites. Accordingly, we conclude here that we can treat these satellites the same as satellites licensed to operate within the stationkeeping box, and that these satellites do not constitute a reason to reject any of the proposals in the *Notice* and *Further Notice*.

³⁴⁰ Spacenet Further Comments at 23-24.

³⁴¹ 47 C.F.R. § 25.210(j)(1).

³⁴² *Notice*, 15 FCC Rcd at 25154 (para. 82), *citing* National Environmental Policy Act of

NEPA, the Commission has adopted Maximum Permissible Exposure (MPE) limits for radiofrequency (RF) radiation emitted by Commission-regulated transmitters and facilities.³⁴³ Section 1.1307(b)(3)(i) requires applicants proposing additional transmitters, facilities, or modifications to a licensed facility to submit an environmental assessment if the resulting emissions causes the power density in a geographic area to exceed the RF exposure limits specified in the Commission's rules by five percent.³⁴⁴

147. The *Notice* proposed revising Section 25.117 of the Commission's rules to state explicitly that earth station licensees seeking modification of their licenses must comply with the RF emission rules.³⁴⁵ SIA supports the Commission's proposal,³⁴⁶ and no one filed any opposition. Accordingly, we will revise Section 25.117 as shown in Appendix B of this Order to cross-reference the RF emission rules.

D. Construction Authorization

148. In 1996, the Commission eliminated the requirement that space station operators and earth station operators obtain authorization prior to beginning construction of their stations.³⁴⁷ The *Notice* stated that the 1996 revisions to Section 25.113 that implement this decision are potentially confusing, and proposed revising Section 25.113 to make it clearer.³⁴⁸ SIA supports the Commission's proposal.³⁴⁹ We adopt the revisions to Section 25.113 proposed in the *Notice* to make clear that satellite and earth station operators are not required to obtain authorization prior to construction of their facilities.³⁵⁰

E. Satellite Control Responsibilities to Resolve Harmful Interference

149. *Background.* Section 25.274 of the Commission's rules sets forth procedures for resolving harmful interference. In cases where an earth station receives interference, and determines that the source is not a terrestrial operator or another earth station communicating with

1969, 42 U.S.C. § 4321 *et seq.*

³⁴³ *Notice*, 15 FCC Rcd at 25154-55 (para. 82), *citing* 47 C.F.R. § 1.1310; Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, *Report and Order*, ET Docket No. 93-62, 11 FCC Rcd 15123 (1996); *Second Memorandum Opinion and Order*, 12 FCC Rcd 13494 (1997).

³⁴⁴ *Notice*, 15 FCC Rcd at 25155 (para. 82), *citing* 47 C.F.R. § 1.1307(b)(3)(i).

³⁴⁵ *Notice*, 15 FCC Rcd at 25155 (para. 83), *citing* 47 C.F.R. § 25.113(b) (new earth station license applications); 47 C.F.R. § 25.116(b)(2) (amendments to pending license applications).

³⁴⁶ SIA Reply at 20.

³⁴⁷ *Notice*, 15 FCC Rcd at 25155 (para. 84), *citing* 1996 *Streamlining Order*, 11 FCC Rcd at 21583-85 (paras. 6-9) (space station construction); 21590-91 (para. 23) (earth station construction).

³⁴⁸ *Notice*, 15 FCC Rcd at 25155 (para. 84).

³⁴⁹ SIA Reply at 20.

³⁵⁰ We note, however, that we still generally require parties to obtain licenses before they operate their facilities.

the satellite system with which it is communicating, Section 25.274(c) directs the earth station operator to contact the control center of the satellite system, who then make "reasonable efforts to determine the source of the problem."³⁵¹ Section 25.274(g) states that "a representative of the earth station suffering undue interference" has the responsibility to contact the control center of the satellite system or systems suspected of causing the interference.³⁵² If Section 25.274(g) is not read in conjunction with Section 25.274(c), it may appear that earth station operators suffering interference must directly contact the suspected system's control center.³⁵³ This is not the case. Allowing a satellite operator to function as the affected earth station operator's representative can help facilitate a solution because satellite operators must maintain a good working relationship with each other in order to resolve coordination issues that come up from time to time. Accordingly, the Commission sought comment on revising Section 25.274(g) to clarify that earth station operators are permitted to contact the control centers for the satellite systems with which they communicate in cases of harmful interference, and to rely on its own satellite system operators to contact the control centers of the potentially interfering satellite systems and resolve the interference.³⁵⁴

150. *Discussion.* Spacenet and Globalstar support revising Section 25.274 as the Commission proposed.³⁵⁵ Furthermore, as the Commission explained in the *Notice*, these revisions do not change the rights and responsibilities of parties in disputes regarding harmful interference, but rather helps clarify those rights and responsibilities.³⁵⁶ Accordingly, we adopt those revisions.³⁵⁷ In addition, Globalstar requests that we revise Section 25.274(e). Currently, this rule states that "[w]here the operations of the suspect earth station are the source of the interference, the licensee of that earth station shall take all measures necessary to eliminate the interference." Globalstar recommends replacing the word "eliminate" with "resolve" in Section 25.274(e) because interference may not be able to be eliminated in all cases.³⁵⁸ Globalstar also recommends reversing the order of Section 25.274(f) and (g) to make clear that, in non-severe cases, an earth station operator should contact the Commission only when good faith efforts to resolve the interference have failed.³⁵⁹ We conclude that the revisions proposed by Globalstar also help clarify Section 25.274, and we therefore adopt them.³⁶⁰

³⁵¹ 47 C.F.R. § 25.274(c).

³⁵² 47 C.F.R. § 25.274(g).

³⁵³ *Notice*, 15 FCC Rcd at 25155-56 (para. 85).

³⁵⁴ *Notice*, 15 FCC Rcd at 25155-56 (para. 85).

³⁵⁵ Globalstar Comments at 7; Spacenet Comments at 46-47. *See also* SIA Reply at 20-21.

³⁵⁶ *Notice*, 15 FCC Rcd at 25155-56 (para. 85).

³⁵⁷ In cases where an earth station operator alleging harmful interference prefers to contact directly the control center of another satellite operator, it is free to do so.

³⁵⁸ Globalstar Comments at 7.

³⁵⁹ Globalstar Comments at 7.

³⁶⁰ In addition, we replace references to "undue interference" in Section 25.274 with "harmful interference." The intent of this revision is to modernize the language of Section 25.274, not to make any substantive change.

F. Extension of Rules to Other FSS Bands

1. Power Limits

151. In the *Notice*, the Commission explained that Sections 25.211 and 25.212 establish power limits for the conventional C-band and Ku-band, but do not explicitly include or exclude other FSS bands.³⁶¹ The Commission proposed amending Sections 25.211 and 25.212 to state explicitly that the Commission may apply the power limits in those sections to any other frequency band, to the extent that power limits for that band have not been established elsewhere in Part 25.³⁶² Since that time, the Commission has adopted default service rules in another proceeding, for use in frequency bands in which the Commission has not adopted any service rules.³⁶³ Therefore, we find that the default power limits proposed in the *Notice* are no longer necessary.

2. Other FSS Requirements

152. Globalstar requests that we do not apply the following proposals to frequency bands other than conventional C- and Ku-bands:³⁶⁴ (1) streamlined procedure for non-routine earth station license applications;³⁶⁵ (2) relaxed power level limits for conventional Ku-band earth stations;³⁶⁶ (3) streamlined procedure for routine Ku-band temporary-fixed earth station license applications;³⁶⁷ and (4) proposed revisions to VSAT rules.³⁶⁸ Globalstar argues, for example, that the technical parameters for the conventional C- and Ku-bands are based on two-degree-spacing, and should not be extended to the L-band.³⁶⁹ We agree with Globalstar. With one exception, the proposals cited by Globalstar were limited to the conventional C- and Ku-bands.³⁷⁰ We do not have any basis for applying those rules to other frequency bands.

³⁶¹ *Notice*, 15 FCC Rcd at 25156 (para. 86); *citing* 47 C.F.R. §§ 25.211, 25.212.

³⁶² *Notice*, 15 FCC Rcd at 25156 (para. 86).

³⁶³ 47 C.F.R. § 25.217; Amendment of the Commission's Space Station Licensing Rules and Policies, *First Report and Order*, IB Docket No. 02-34, 18 FCC Rcd 10760, 10783-86 (paras. 51-54) (2003) (*First Space Station Reform Order*).

³⁶⁴ Globalstar Comments at 2-3.

³⁶⁵ Section III., *supra*.

³⁶⁶ Section IV.B., *supra*.

³⁶⁷ Section IV.C., *supra*.

³⁶⁸ Section V., *supra*.

³⁶⁹ Globalstar Comments at 2-3.

³⁷⁰ The one exception is that the Commission invited comment on applying our proposed rules for random access techniques to Ka-band blanket earth station licenses. *See Notice*, 15 FCC Rcd at 25148 (para. 57). Here, we assure Globalstar that the Commission did not propose or seek comment on applying any VSAT rules to the L-band.

153. In response to Globalstar's concern, we have revised all the references to the C-band and Ku-band in Part 25 to make clear which requirements apply only to the conventional C-band and Ku-band, and which requirements also apply to the extended C-band and Ku-band. Those rule revisions are not intended to change any current requirement, but merely to clarify existing requirements. These rule revisions are set forth in Appendix B.³⁷¹

G. Half-Power Beam Width

154. *Background.* In the *Further Notice*, the Commission observed that several frequency bands in the Table of Frequency Allocations are shared between government and non-government operations.³⁷² When an earth station applicant seeks authority to operate in such a shared band, the Commission must coordinate with the National Telecommunications and Information Administration (NTIA). This coordination requires the half-power beam width of the earth station antenna. Our rules currently do not require applicants to submit half-power beam width. As a result, we often must request the applicant to provide this information, delaying completion of coordination and our action on the application. Therefore, the Commission proposed requiring applicants for earth station authority in shared government-non-government bands to provide information on half-power beam width.³⁷³

155. *Discussion.* SIA supports this information requirement, but only for the 13.75-14.0 GHz band. SIA claims that this is the only band for which the Commission needs this information to complete NTIA coordination.³⁷⁴ We disagree with SIA. Several frequency bands in addition to the 13.75-14.0 GHz band require coordination between the NTIA and the Commission.³⁷⁵ We need half-power beam width to coordinate earth stations in those shared bands. Therefore, we will require all earth station applicants seeking to operate in shared government/non-government bands to provide half-power beam width information as an attachment to their applications.

H. General Part 25 Modifications

156. The *Notice* also considered several miscellaneous revisions to Part 25, such as updating cross-references and defining new terms in Section 25.201.³⁷⁶ The Commission did not

³⁷¹ Sections 25.201, 25.210, 25.211, and 25.212 contain revised references to the C-band. Sections 25.115, 25.133, 25.134, 25.201, 25.209, 25.211, and 25.212 contain revised references to the Ku-band.

³⁷² *Further Notice*, 17 FCC Rcd at 18636 (para. 138).

³⁷³ *Further Notice*, 17 FCC Rcd at 18636 (para. 138).

³⁷⁴ SIA Further Comments at 26 and n. 21.

³⁷⁵ Examples of these frequency bands are the 3600-3650 MHz, 5850-5925 MHz, and 8025-8400 MHz band, and the "Little LEO" bands: 137-137.025 MHz, 137.175-137.825 MHz, and 400.15-401 MHz. In addition, earth stations in the 3650-3700 may need to be coordinated with government operations, depending on where they are located. For all shared government/non-government bands requiring coordination, see 47 C.F.R. § 2.106.

³⁷⁶ *Notice*, 15 FCC Rcd at 25157 (para. 90).

discuss or list all these proposed revisions individually, but instead set them out in Appendix B of the *Notice*. No one expressed any opposition to those revisions,³⁷⁷ and we adopt them as they were proposed in Appendix B of the *Notice*.³⁷⁸ In addition, in the *Further Notice*, the Commission invited comment on revising Section 25.161(b)³⁷⁹ so that the reference to the license renewal requirements is "Section 25.121(e) rather than "Section 25.120(e)." It also proposed revising Section 25.203(g)(1)³⁸⁰ so that the reference to FCC monitoring stations is "Section 0.121(b)" rather than "Section 0.121(c)."³⁸¹ SIA supports correcting these cross-references.³⁸² Accordingly, we adopt these rule revisions as proposed.

157. The Commission also invited commenters to make additional proposals and suggestions for streamlining our rules.³⁸³ We consider those proposals below.

1. Extension of ALSAT Authority

158. Loral recommends extending ALSAT authority to all routinely authorized earth stations currently in operation.³⁸⁴ "ALSAT" authority allows the earth station to communicate with all U.S.-licensed satellites, and all U.S.-licensed satellites on the Permitted List, subject to any service restrictions or technical conditions placed on that satellite. Routine earth station operators are free to request ALSAT authority at the time they file their applications, and they are free to modify their licenses to add ALSAT authority at any time they desire. Except in isolated cases to implement a change in Commission policy,³⁸⁵ we have not questioned any earth station operator's business decision to refrain from obtaining operating authority for which it may be eligible. We see no policy justification to depart from that practice in this case.

2. Size of Area of Gateway Antenna Complex

159. About one week before the Commission adopted the *Notice*, it adopted rules governing non-geostationary orbit (NGSO) fixed-satellite service (FSS) systems operating in the

³⁷⁷ Astrolink generally supports all the proposals in Section VII. of the *Notice*. Astrolink Comments at 14-15.

³⁷⁸ See *Notice*, 15 FCC Rcd at 25174-90 (App. B).

³⁷⁹ 47 C.F.R. § 25.161(b).

³⁸⁰ 47 C.F.R. § 25.203(g)(1).

³⁸¹ *Further Notice*, 17 FCC Rcd at 18636 (para. 139), citing 47 C.F.R. §§ 25.161(b), 25.203(g)(1).

³⁸² SIA Further Comments at 26.

³⁸³ *Notice*, 15 FCC Rcd at 25157 (para. 91).

³⁸⁴ Loral Comments at 13.

³⁸⁵ See *DISCO I*, 11 FCC Rcd at 2437 (para. 55); *DISCO II First Reconsideration Order*, 15 FCC Rcd at 7215 (para. 19).

Ku-band.³⁸⁶ In that Order, the Commission adopted a definition of "gateway" earth stations that requires a single complex of multiple gateway earth stations to be located within an area of one second of latitude by one second of longitude.³⁸⁷

160. Globalstar suggests relaxing the requirement that a separate license must be issued for each fixed gateway antenna that is more than one second in latitude or longitude from the lead licensed gateway antenna.³⁸⁸ Globalstar explains that it usually places multiple antennas in a remote, relatively small geographic area, and that the frequency coordination with terrestrial services conducted by Globalstar accounts for all the antennas in that area.³⁸⁹

161. We will not adopt Globalstar's suggestion. While Globalstar may place multiple antennas in a relatively small geographic area,³⁹⁰ it is not clear that all gateway earth station operators do. The purpose of the one-second rule is to ensure that all the antennas included in a given license are included in the coordination of the licensed facilities with terrestrial wireless operators. Accordingly, we reaffirm our conclusion that the one-second requirement is needed to facilitate coordination with potentially affected terrestrial wireless and microwave operators.³⁹¹

3. *Pro Forma* Transfers of Control

162. Loral and Hughes advocate a notification process or a grant-stamp procedure for *pro forma* transfers of control and assignments.³⁹² We have already streamlined our procedures for *pro forma* transfers of control. Applicants are required only to complete the Main Form and Schedule A of Form 312. We do not provide notice and opportunity for comment on *pro forma* transfer of control applications. In addition, we act on *pro forma* transfer of control applications in "action taken" public notices rather than by Order. Neither Loral nor Hughes have explained how a notification process or a grant-stamp procedure would able us to act on *pro forma* transfer of control applications any faster than we do now.

³⁸⁶ *Ku-band NGSO Order*, 16 FCC Rcd 4096.

³⁸⁷ *Ku-band NGSO Order*, 16 FCC Rcd at 4112 (para. 30).

³⁸⁸ Globalstar Comments at 6-7.

³⁸⁹ Globalstar Comments at 6-7.

³⁹⁰ Globalstar Comments at 6-7.

³⁹¹ *Ku-band NGSO Order*, 16 FCC Rcd at 4112 (para. 30).

³⁹² Loral Comments at 16-18, *citing* Federal Communications Bar Association's Petition for Forbearance from Section 310(d) of the Communications Act Regarding Non-Substantial Assignments of Wireless Licenses and Transfers of Control Involving Telecommunications Carriers and Personal Communications Industry Association's Broadband Personal Communications Services Alliance's Petition for Forbearance for Broadband Personal Communications Services, *Memorandum Opinion and Order*, 13 FCC Rcd 6293 (1998); Hughes Reply at 19. *See also* SIA Reply at 23-24.

4. Other Issues

163. Currently, Section 25.132 establishes antenna performance verification standards for all earth station antennas.³⁹³ SIA notes that the Commission codified separate antenna performance verification standards for Ka-band earth station antennas in another rule.³⁹⁴ Accordingly, as SIA suggests, we revise Section 25.132 to cross-reference the Ka-band earth station antenna performance verification standards.

164. GCI recommends limiting routine processing to digital carriers because they are more efficient than analog carriers.³⁹⁵ For several years, licensees have been voluntarily transitioning from analog to digital transmissions for business reasons. GCI has not shown that regulatory intervention into that transition is warranted. Furthermore, if continued analog transmissions were an unacceptably inefficient use of spectrum, it would be more reasonable to address that issue directly by prohibiting analog transmissions than it would to discourage analog transmissions indirectly by adopting an unnecessary procedure for analog licenses.

I. Scope of Rulemaking Authority Under Section 11

165. Spacenet notes that Section 11 directs the Commission to "repeal or modify any regulation . . . no longer in the public interest," and claims that this precludes us from considering any proposal to strengthen any substantive requirement in this Order.³⁹⁶ Initially, we note that we have not adopted any more burdensome requirements in this Order. Further, nothing in Section 11 affects the Commission's broad discretion to determine whether and when to initiate rulemakings,³⁹⁷ and, after notice and opportunity for comment, to adopt new rules or revise existing rules in a reasoned manner.

VII. CONCLUSION

166. In this Order, we have established a streamlined procedure for reviewing non-routine earth station applications. We have increased the Ku-band downlink EIRP density limit for routine processing of Ku-band earth stations from 6 to 10 dBW/4 kHz. Furthermore, we modify, relax, or clarify several of our Part 25 rules, including the rules governing VSAT systems, METs, and temporary-fixed earth stations.

³⁹³ 47 C.F.R. § 25.132.

³⁹⁴ SIA November 5, 2001 *Ex Parte* Statement, Att. 1 at 1-2. *See* 47 C.F.R. §§ 25.138(d), (e).

³⁹⁵ GCI Further Comments at 4.

³⁹⁶ Spacenet Comments at 5-6.

³⁹⁷ *See* *WWHT v. FCC*, 656 F.2d 807 (D.C. Cir. 1981). *See also* *Telecommunications Resellers Assn. v. FCC*, 141 F.3d 1193, 1197 n.6 (D.C. Cir. 1998) (Commission has discretion to initiate rulemaking even in case where the court found that a rulemaking was not "necessary" to implement a statutory requirement).

VIII. PROCEDURAL MATTERS

167. *Final Regulatory Flexibility Analysis.* As required by the Regulatory Flexibility Act (RFA),³⁹⁸ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated into the *Notice* and *Further Notice*.³⁹⁹ The Commission sought written public comments on the possible significant economic impact of the proposed policies and rules on small entities in the *Notice*, including comments on the IRFA. No one commented specifically on the IRFA. Pursuant to the RFA,⁴⁰⁰ a Final Regulatory Flexibility Analysis is contained in Appendix E.

168. *Paperwork Reduction Act.* This Order contains new and modified information collection(s). The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection(s) contained in this NPRM, as required by the Paperwork Reduction Act of 1995, Public Law No. 104-13. Public and agency comments are due 60 days from date of publication of the NPRM in the Federal Register. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law No. 107-198, *see* 44 U.S.C. § 3506(c)(4), we seek specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees."

169. A copy of any comments on the information collections contained herein should be submitted to Judy Boley Herman, Federal Communications Commission, Room 1-C804, 445 12th Street, SW, Washington, DC 20554, or via the Internet to jbHerman@fcc.gov and to Kristy L. LaLonde, OMB Desk Officer, Room 10234 NEOB, 725 17th Street, N.W., Washington, DC 20503, via the Internet to Kristy_L.LaLonde@omb.eop.gov, or via fax at 202-395-5167.

170. *Privacy Impact Assessment.* The Commission has performed a Privacy Impact Assessment as required by the Privacy Act, as amended by the E-Government Act of 2002.⁴⁰¹ The Commission has determined that this information collection does not affect individuals or households; thus, there are no impacts under the Privacy Act.

IX. ORDERING CLAUSES

171. Accordingly, IT IS ORDERED, pursuant to Sections 4(i), 7(a), 11, 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 157(a), 161, 303(c), 303(f), 303(g), 303(r), that this Fifth Report and Order in IB Docket No. 00-248 is hereby ADOPTED.

³⁹⁸ See 5 U.S.C. § 603.

³⁹⁹ *Notice*, 15 FCC Rcd at 25212-15 (App. G); *Further Notice*, 17 FCC Rcd at 18642-45 (App. C).

⁴⁰⁰ See 5 U.S.C. § 604.

⁴⁰¹ 5 U.S.C. § 552a.

172. IT IS FURTHER ORDERED that Part 25 of the Commission's rules IS AMENDED as set forth in Appendix B.

173. IT IS FURTHER ORDERED that the Chief, International Bureau is delegated authority to develop a list of approved non-routine earth station antennas as set forth in this Order above.

174. IT IS FURTHER ORDERED that the provisions of this Order will be effective 30 days after a summary of this Order is published in the Federal Register, except for the new information collection requirements.

175. This Report and Order contains information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13, that are not effective until approved by the Office of Management and Budget. The Federal Communications Commission will publish a document in the Federal Register following approval of the information collection by the Office of Management and Budget (OMB) announcing the effective date of those rules.

176. IT IS FURTHER ORDERED that the Commission's Office of Consumer and Government Affairs, Reference Information Center, SHALL SEND a copy of this Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

177. IT IS FURTHER ORDERED that CC Docket No. 86-496 is TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX AParties filing PleadingsComments (March 26, 2001)

1. Aloha Networks, Inc. (Aloha Networks)
2. Andrew Corporation
3. Astrolink International LLC (Astrolink)
4. GE American Communications, Inc. (GE Americom)
5. Globalstar USA, Inc. and Globalstar, L.P. (Globalstar)
6. Hughes Network Systems, Hughes Communications, Inc., and Hughes Communications Galaxy, Inc. (together, Hughes)
7. Loral Space & Communications Ltd. (Loral)
8. Motient Services, Inc. (Motient)
9. New Skies Satellites N.V. (New Skies)
10. PanAmSat Corporation (PanAmSat)¹
11. Spacenet, Inc., and StarBand Communications, Inc. (together, Spacenet)
12. Telesat Canada (Telesat)
13. WorldCom, Inc. (WorldCom)

Replies (May 7, 2001)

1. Aloha Networks²
2. Astrolink
3. Comtech Mobile Datacom Corp. (CMDCC)
4. GE Americom
5. Hughes
6. National Radio Astronomy Observatory (NRAO)
7. OnSat Network Communications, Inc. (Onsat)
8. PanAmSat
9. Satellite Industry Association (SIA)
10. Spacenet
11. Telesat

Further Comments (March 10, 2003)

1. Aloha Networks, Inc. (Aloha Networks)
2. General Communication, Inc. (GCI)
3. QUALCOMM, Incorporated (Qualcomm)
4. SIA
5. Spacenet

¹ On April 10, 2001, PanAmSat corrected certain minor errors and re-filed its comments.

² On May 9, 2001, Aloha Networks corrected certain minor errors and re-filed its reply.

Further Replies (April 8, 2003)

1. Aloha Networks
2. Qualcomm
3. SIA
4. Spacenet
5. Telesat

Ex Parte Statements

1. Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Magalie Roman Salas, Secretary, FCC (dated Oct. 22, 2001) (PanAmSat October 22, 2001 *Ex Parte* Statement).
2. Letter from Richard DalBello, Executive Director, Satellite Industry Association, to Magalie Roman Salas, Secretary, FCC (dated Nov. 5, 2001) (SIA November 5, 2001 *Ex Parte* Statement).
3. Letter from Dori K. Bailey of Latham and Watkins, to Magalie Roman Salas, Secretary, FCC (dated Dec. 11, 2001) (SIA November 19, 2001 *Ex Parte* Statement).³
4. Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Magalie Roman Salas, Secretary, FCC (dated Nov. 20, 2001) (PanAmSat November 20, 2001 *Ex Parte* Statement).
5. Letter from Dori K. Bailey of Latham and Watkins, to Magalie Roman Salas, Secretary, FCC (dated Dec. 11, 2001) (SIA December 10, 2001 *Ex Parte* Statement).
6. Letter from Dori K. Bailey of Latham and Watkins, to Magalie Roman Salas, Secretary, FCC (dated Dec. 21, 2001) (Hughes December 21, 2001 *Ex Parte* Statement).
7. Surreply of the Satellite Industry Association to the Reply Comments of Telesat Canada and Qualcomm, Incorporated (dated Oct. 3, 2003) (SIA October 3, 2003 *Ex Parte* Statement).
8. Letter from Jacob S. Farber, Attorney for Aloha Networks, Inc., to Marlene H. Dortch, Secretary, FCC (dated Nov. 14, 2003) (Aloha Networks November 14, 2003 *Ex Parte* Statement).
9. Letter from Lewis J. Paper, Attorney for Aloha Networks, Inc., to Marlene H. Dortch, Secretary, FCC (dated Feb. 3, 2004) (Aloha Networks February 3, 2004 *Ex Parte* Statement).
10. Letter from Richard DalBello, President, Satellite Industry Association, to Marlene H. Dortch, Secretary, FCC (dated Mar. 23, 2004) (SIA March 23, 2004 *Ex Parte* Statement).
11. Letter from Dean R. Brenner, Attorney for Qualcomm Incorporated, to Marlene H. Dortch, Secretary, FCC (dated Mar. 31, 2004) (Qualcomm March 31, 2004 *Ex Parte* Statement).
12. Letter from Carlos M. Nalda, Attorney for The Boeing Company, to Marlene H. Dortch, Secretary, FCC (dated Apr. 14, 2004) (Boeing April 14, 2004 *Ex Parte* Statement).
13. Letter from Carlos M. Nalda, Attorney for The Boeing Company, to Marlene H. Dortch, Secretary, FCC (dated Apr. 19, 2004) (Boeing April 19, 2004 *Ex Parte* Statement).
14. Letter from Jacob S. Farber, Attorney for Aloha Networks, Inc., to Marlene H. Dortch, Secretary, FCC (dated May 12, 2004) (Aloha Networks May 12, 2004 *Ex Parte* Statement).

³ Although SIA made this oral *ex parte* presentation to Commission staff on November 19, 2001, it did not file a written summary of its *ex parte* presentation until December 11, 2001. Section 1.1206(b)(2) of the Commission's rules requires persons making oral *ex parte* presentations that include new data or arguments to summarize the new information in writing and file it with the Commission no later than one business day after the *ex parte* presentation. 47 C.F.R. § 1.1206(b)(2). In the *Further Notice*, the Commission determined that it need not determine what action, if any, is warranted with respect to SIA's late-filed *ex parte* statement, as the proposals in the November 19, 2001 *Ex Parte* Statement are the same as those in the SIA November 5, 2001 *Ex Parte* Statement and the SIA December 10, 2001 *Ex Parte* Statement. *Further Notice*, 17 FCC Rcd at 18590 n.29.

15. Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene H. Dortch, Secretary, FCC (dated Nov. 19, 2004) (PanAmSat November 19, 2004 *Ex Parte* Statement).
16. Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene H. Dortch, Secretary, FCC (dated Feb. 1, 2005) (SIA February 1, 2005 *Ex Parte* Statement).

APPENDIX BRule Changes

For the reasons discussed above, the Federal Communications Commission amends title 47 of the Code of Federal Regulations, part 25, as follows:

PART 25 -- SATELLITE COMMUNICATIONS

1. 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, 332, unless otherwise noted.

2. Amend §25.109 by revising paragraph (c) to read as follows:

§25.109 Cross-reference.

* * * * *

(c) Ship earth stations in the Maritime Mobile Satellite Service, see 47 CFR part 80.

3. Amend § 25.113 by revising the section heading and paragraph (a), and removing and reserving paragraph (b) to read as follows:

§ 25.113 Station licenses and launch authority.

(a) Construction permits are not required for satellite earth stations. Construction of such stations may commence prior to grant of a license at the applicant's own risk. Applicants must comply with the provisions of 47 CFR 1.1312 relating to environmental processing prior to commencing construction.

(b) [Reserved].

* * * * *

4. Amend § 25.115 by revising paragraphs (a)(1) and (c)(1) to read as follows:

§ 25.115 Application for earth station authorizations.

(a)(1) Transmitting earth stations. Commission authorization must be obtained for authority to operate a transmitting earth station. Applications shall be filed electronically on FCC Form 312, Main Form and Schedule B, and include the information specified in Section 25.130, except as set forth in paragraph (a)(2).

* * * * *

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

* * * * *

5. Amend § 25.117 by adding paragraph (g), to read as follows:

§25.117 Modification of station license.

* * * * *

(g) In cases where an earth station licensee proposes additional transmitters, facilities, or modifications, the resulting transmissions of which can reasonably be expected to cause the power density to exceed the RF exposure limits specified in Part 1, Subpart I of the Commission's rules by five percent, the licensee must submit an environmental assessment pursuant to Section 1.1307(b)(3)(i) of the Commission's rules as an attachment to its modification application.

6. Amend § 25.118 by revising paragraph (a)(5) to read as follows:

§25.118 Modifications not requiring prior authorization.

(a) * * *

(5) Earth station operators may change their points of communication without prior authorization, provided that the change results from a space station license modification described in paragraph (e) of this Section, and the earth station operator does not repoint its antenna. Otherwise, any modification of an earth station license to add or change a point of communication will be considered under § 25.117 of this part.

* * * * *

7. Amend § 25.130 by revising paragraph (a) and adding paragraph (f) to read as follows:

§ 25.130 Filing requirements for transmitting earth stations.

(a) Applications for a new or modified transmitting earth station facility shall be submitted on FCC Form 312, Main Form and Schedule B, accompanied by any required exhibits, except for those earth station applications filed on FCC Form 312EZ pursuant to Section 25.115(a) of this Chapter. All such earth station license applications must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter. Additional filing requirements for ESVs are described in §§ 25.221 and 25.222 of this Chapter. In addition, applicants not required to submit applications on Form 312EZ, other than ESV applicants, must submit the following information to be used as an "informative" in the public notice issued under § 25.151 as an attachment to their application:

- (1) A detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellite(s) with which it plans to operate, or the eastern and western boundaries of the arc it plans to coordinate.
- (2) The diameter or equivalent diameter of the antenna.
- (3) Proposed power and power density levels.
- (4) Identification of any random access technique, if applicable.
- (5) Identification of a specific rule or rules for which a waiver is requested.

* * * * *

(f) Applicants seeking to operate in a shared government/non-government band must provide the half-power beam width of their proposed earth station antenna, as an attachment to their applications.

8. Amend § 25.131 by revising paragraph (a) to read as follows:

§ 25.131 Filing requirements for receive-only earth stations.

(a) Except as provided in paragraphs (b) and (j) of this section, and Section 25.115(a) of this Chapter, applications for a license for a receive-only earth station shall be submitted on FCC Form 312, Main Form and Schedule B, accompanied by any required exhibits and the information described in §§ 25.130(a)(1) through 25.130(a)(5) of this chapter. All such earth station license applications must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

* * * * *

9. Amend § 25.132 by revising paragraph (a) and adding paragraph (b)(3) to read as follows:

§ 25.132 Verification of earth station antenna performance standards.

(a)(1) All applications for transmitting earth stations, except for earth stations operating in the 20/30 GHz band, must be accompanied by a certificate pursuant to § 2.902 of this chapter from the manufacturer of each antenna that the results of a series of radiation pattern tests performed on representative equipment in representative configurations by the manufacturer demonstrates that the equipment complies with the performance standards set forth in § 25.209. The licensee must be prepared to demonstrate the measurements to the Commission on request.

(2) All applications for transmitting earth stations operating in the 20/30 GHz band must be accompanied by the measurements specified in §§25.138(d) and (e) of this Chapter.

(b) * * *

(3) Applicants seeking authority to use an antenna that does not meet the standards set forth in §§ 25.209(a) and (b), pursuant to the procedure set forth in § 25.220 of this Chapter, are required to submit a copy of the manufacturer's range test plots of the antenna gain patterns specified in paragraph (b)(1) of this section.

* * * * *

10. Amend § 25.133 by revising paragraphs (a) and (b) to read as follows:

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

(a)(1) Each license for an earth station governed by this part, except for mobile satellite earth station terminals (METs), shall specify as a condition therein the period in which construction of facilities must be completed and station operation commenced. Construction of the earth station must be completed and the station must be brought into operation within 12 months from the date of the license grant except as may be determined by the Commission for any particular application.

(2) Each license for mobile satellite earth station terminals (METs) shall specify as a condition therein the period in which station operation must be commenced. The networks in which the METs will be operated must be brought into operation within 12 months from the date of the license grant except as may be determined by the Commission for any particular application.

(b)(1) Each license for a transmitting earth station included in this part, except for earth stations licensed under a blanket licensing provision, shall also specify as a condition therein that upon the completion of construction, each licensee must file with the Commission a certification containing the following information:

- (i) The name of the licensee;
- (ii) File number of the application;
- (iii) Call sign of the antenna;
- (iv) Date of the license;
- (v) A certification that the facility as authorized has been completed and that each antenna facility has been tested and is within 2 dB of the pattern specified in § 25.209, § 25.135 (NVNG MSS earth stations), or § 25.213 (1.6/2.4 GHz Mobile-Satellite Service earth stations);
- (vi) The date on which the earth station became operational; and
- (vii) A statement that the station will remain operational during the license period unless the license is submitted for cancellation.

(2) For earth stations authorized under any blanket licensing provision in this Chapter, a certification containing the information in paragraph (b)(1) of this Section must be filed when the network is put into operation.

* * * * *

11. Amend § 25.134 by revising paragraphs (a)(1), (b), and (d), removing and reserving paragraph (c), and adding paragraphs (e) and (f), to read as follows:

§ 25.134 Licensing provisions of Very Small Aperture Terminal (VSAT) and C-band Small Aperture Terminal (CSAT) networks.

(a)(1) VSAT networks operating in the 12/14 GHz bands. All applications for digital VSAT networks with a maximum outbound downlink EIRP density of +10.0 dBW/4 kHz per carrier and earth station antennas with maximum input power density of -14 dBW/4 kHz will be processed routinely. All applications for analog VSAT networks with maximum outbound downlink power

densities of +17.0 dBW/4 kHz per carrier and maximum antenna input power densities of -8.0 dBW/4 kHz shall be processed routinely in accordance with Declaratory Order in the Matter of Routine Licensing of Earth Stations in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, Respectively, for Both Full Transponder and Narrowband Transmissions, 2 FCC Rcd 2149 (1987) (Declaratory Order).

* * *

(b) *VSAT networks operating in the 11.7-12.2 GHz and 14.0-14.5 GHz band.* Each applicant for digital and/or analog VSAT network authorization proposing to use transmitted satellite carrier EIRP densities and/or maximum antenna input power in excess of those specified in paragraph (a) of this Section must comply with the procedures set forth in § 25.220.

(c) [Reserved.]

(d) An application for VSAT authorization shall be filed on FCC Form 312, Main Form and Schedule B.

(e) VSAT operators in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands are permitted to use more than one hub earth station in their networks.

(f) VSAT operators in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands are permitted to use temporary fixed earth stations as either hub earth stations or remote earth stations in their networks, but must specify the number of temporary fixed earth stations they plan to use in their networks at the time of their applications.

§ 25.144 [Amended]

12. In §25.144, remove and reserve paragraph (a)(1).

13. Amend § 25.151 by revising paragraphs (c)(2) and (d), and adding paragraph (e) to read as follows:

§ 25.151 Public notice period.

* * * * *

(c) * * *

(2) For temporary authorization pursuant to § 25.120.

* * * * *

(d) Except as specified in paragraph (e) of this section, no application that has appeared on public notice will be granted until the expiration of a period of thirty days following the issuance of the public notice listing the application, or any major amendment thereto. Any comments or petitions must be delivered to the Commission by that date in accordance with §25.154.

(e)(1) Applicants seeking authority to operate a temporary fixed earth station pursuant to §25.277 may consider their applications "provisionally granted," and may initiate operations upon the placement of the complete FCC Form 312 application on public notice, provided that

- (i) The temporary fixed earth station will operate only in the conventional Ku-band (14.0-14.5 GHz and 11.7-12.2 GHz bands);
- (ii) The temporary fixed earth station's operations will be consistent with all routine-licensing requirements for the conventional Ku-band; and
- (iii) The temporary fixed earth station's operations will be limited to satellites on the Permitted Space Station List.

(2) Applications for authority granted pursuant to paragraph (e)(1) of this section shall be placed on public notice pursuant to paragraph (a)(1) of this section. If no comments or petitions are filed within 30 days of the public notice date, the authority granted will be considered a regular temporary fixed earth station authorization as of 30 days after the public notice date. If a comment or petition is filed within 30 days of the public notice date, the applicant must suspend operations immediately pending resolution of the issues raised in that comment or petition.

14. Amend § 25.154 by revising paragraphs (c) and (d) and adding paragraph (e) to read as follows:

§ 25.154 Oppositions to applications and other pleadings.

* * * * *

(c) Except for opposition to petitions to deny an application filed pursuant to § 25.220 of this chapter, oppositions to petitions to deny an application or responses to comments and informal objections regarding an application may be filed within 10 days after the petition, comment, or objection is filed and must be in accordance with other applicable provisions of §§ 1.41 through 1.52 of this chapter, except that such oppositions must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

(d) Except for opposition to petitions to deny an application filed pursuant to § 25.220 of this chapter, reply comments by the party that filed the original petition may be filed with respect to pleadings filed pursuant to paragraph (c) of this section within 5 days after the time for filing oppositions has expired unless the Commission otherwise extends the filing deadline and must be in accordance with other applicable provisions of §§ 1.41 through 1.52 of this chapter, except that such reply comments must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

(e) If a petition to deny an application filed pursuant to § 25.220 is filed, the applicant must file a statement with the Commission explaining whether the applicant has resolved all outstanding issues raised by the petitioner, within 30 days of the date the petition for deny is filed. This statement must be in accordance with the provisions of §§ 1.41 through 1.52 of this chapter applicable to oppositions to petitions to deny, except that such reply comments must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

15. Revise § 25.201 by adding introductory language, and by adding the following definitions in alphabetical order to read as follows:

§25.201 Definitions.

Definitions for terms in subpart C of this part appear in this section, and in § 2.1 of this chapter.

* * * * *

C-band. For purposes of this part, the terms "C-band" and "conventional C-band" refer specifically to the 3700-4200 MHz downlink and 5925-6425 MHz uplink frequency bands. These paired bands are allocated to the Fixed-Satellite Service and are also referred to as the 4/6 GHz band(s).

* * *

Electronic filing. The submission of applications, exhibits, pleadings, or other filings to the Commission in an electronic form using *Internet* or *World Wide Web* on-line filing forms.

* * *

Equivalent diameter. When circular aperture reflector antennas are employed, the size of the antenna is generally expressed as the diameter of the antenna's main reflector. When non-reflector or non-circular aperture antennas are employed, an equivalent diameter can be computed for the antenna. The equivalent diameter is the diameter of a hypothetical circular aperture antenna with the same aperture area as the actual antenna. For example, an elliptical aperture antenna with major axis, a , and minor axis, b , will have an equivalent diameter of $[a \times b]^{1/2}$. A rectangular aperture antenna with length, l , and width, w , will have an equivalent diameter of $[4(l \times w)/\pi]^{1/2}$.

* * *

Ku-band. In this rule part, the terms "Ku-band" and "conventional Ku-band" refer specifically to the 11700-12200 MHz downlink and 14000-14500 MHz uplink frequency bands. These paired bands are allocated to the Fixed-Satellite Service and are also referred to as the 12/14 GHz band(s).

* * *

Permitted Space Station List. A list of satellites operating in the C-band and/or Ku-band including all U.S.-licensed satellites and those non-U.S.-licensed satellites for which the Commission has authorized routine U.S.-licensed earth stations to communicate with that satellite, and the satellite operator has requested the Commission to place its satellite on the Permitted Space Station List.

* * *

Power flux density. The amount of power flow through a unit area within a unit bandwidth. The units of power flux density are those of power spectral density per unit area, namely watts per hertz per square meter. These units are generally expressed in decibel form as dB(W/Hz/m²), dB(W/m²) in a 4 kHz band, or dB(W/m²) in a 1 MHz band.

* * *

Power spectral density. The amount of an emission's transmitted carrier power falling within the stated reference bandwidth. The units of power spectral density are watts per hertz and are generally expressed in decibel form as dB(W/Hz), dB(W/4kHz), or dB(W/1MHz).

* * *

Routine processing or licensing. A licensing process whereby applications are processed in an expedited fashion. Such applications must be complete in all regards and consistent with all Commission Rules and must not raise any policy issues. With respect to earth station licensing, an application is "routine" only if it conforms to all antenna, power, coordination, radiation hazard, and FAA notification rules, and accesses only "Permitted Space Station List" satellites in the conventional C-band or Ku-band frequency bands.

* * * * *

§ 25.202 [Amended]

16. In § 25.202, remove and reserve paragraph (a)(2).

17. In §25.204, revise paragraphs (a) and (b) to read as follows:

§ 25.204 Power limits.

(a) In bands shared coequally with terrestrial radio communication services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station, other than an ESV, operating in frequency bands between 1 and 15 GHz, shall not exceed the following limits except as provided for in paragraph (c) of this section:

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

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

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

(b) In bands shared coequally with terrestrial radiocommunication services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15 GHz shall not exceed the following limits except as provided for in paragraph (c) of this section:

+64 dBW in any 1 MHz band for $\theta \leq 0^\circ$

+64 + 3 θ dBW in any 1 MHz band for $0^\circ < \theta \leq 5^\circ$

where θ is as defined in paragraph (a) of this section.

* * * * *

18. In § 25.209, revise paragraph (f), to read as follows:

§25.209 Antenna performance standards.

* * * * *

(f) An earth station with an antenna not conforming to the standards of paragraphs (a) and (b) of this section will be authorized after February 15, 1985 upon a finding by the Commission that unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacing. An earth station antenna initially authorized on or before February 15, 1985 will be authorized by the Commission to continue to operate as long as such operations are found not to cause unacceptable levels of adjacent satellite interference. In either case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations. The applicant has the burden of demonstrating that its antenna not conforming to the standards of paragraphs (a) and (b) of this section will not cause unacceptable interference. This demonstration must comply with the procedures set forth in § 25.220.

* * * * *

19. In § 25.210, revise the introductory language in paragraph (a) to read as follows:

§ 25.210 Technical requirements for space stations in the Fixed-Satellite Service.

(a) All space stations in the Fixed-Satellite Service used for domestic service in the 3700-4200 MHz and 5925-6425 MHz frequency bands shall:

* * * * *

20. In § 25.211, revise the section heading and paragraph (d), and add paragraphs (e) and (f), to read as follows:

§25.211 Analog video transmissions in the Fixed-Satellite Services.

* * * * *

(d) An earth station may be routinely licensed for transmission of full transponder video analog services provided:

- (1) In the 5925-6425 MHz band, with an antenna equivalent diameter 4.5 meters or greater, the maximum input power into the antenna does not exceed 26.5 dBW; or
- (2) In the 14.0-14.5 GHz band, with an antenna equivalent diameter of 1.2 meters or greater, the maximum input power into the antenna does not exceed 27 dBW.

(e) Antennas smaller than those specified in paragraph (d) of this section are subject to the provisions of Section 25.220 of this Chapter, which may include power reduction requirements. These antennas will not be routinely licensed for transmission of full transponder services.

(f) Each applicant for authorization for analog transmissions in the fixed-satellite service proposing to use maximum power into the antenna in excess of those specified in Section 25.211(d), must comply with the procedures set forth in § 25.220 of this Chapter.

21. In § 25.212, revise the section heading and paragraphs (c) and (d), and add new paragraph (e), to read as follows:

§ 25.212 Narrowband analog transmissions, digital transmissions, and video transmissions in the GSO Fixed-Satellite Service.

* * * * *

(c) In the 14.0-14.5 GHz band, an earth station with an antenna equivalent diameter of 1.2 meters or greater may be routinely licensed for transmission of narrowband analog services with bandwidths up to 200 kHz if the maximum input power spectral density into the antenna does not exceed -8 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed 13 dBW/4 kHz. Such earth stations may be routinely licensed for transmission of narrowband and/or wideband digital services, including digital video services, if the maximum input spectral power density into the antenna does not exceed -14 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed +6.0 dBW/4 kHz. Antennas with a smaller major or minor axis in the 14 GHz band are subject to the provisions of §25.220 of this chapter, which may include power reduction requirements.

(d) In the 5925-6425 MHz band, an earth station with an equivalent diameter of 4.5 meters or greater may be routinely licensed for transmission of SCPC services if the maximum power densities into the antenna do not exceed +0.5 dBW/4 kHz for analog SCPC carriers with bandwidths up to 200 kHz, and do not exceed -2.7 dBW/4 kHz for narrow and/or wideband digital SCPC carriers. Antennas with an equivalent diameter smaller than 4.5 meters in the 5925-6425 MHz band are subject to the provisions of §25.220 of this chapter, which may include power reduction requirements.

(e) Each applicant for authorization for transmissions in the fixed-satellite service proposing to use transmitted satellite carrier EIRP densities, and/or maximum antenna input power densities in excess of those specified in paragraph (c) of this Section in the 14.0-14.5 GHz band, or in paragraph (d) of this Section in the 5925-6425 MHz band, respectively, must comply with the procedures set forth in § 25.220 of this Chapter.

22. Revise Part 25 by adding new § 25.220 to read as follows:

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

- (a)(1) This section applies to earth station applications other than ESV applications in which:
- (i) The proposed antenna does not conform to the standards of §§25.209(a) and (b), and/or
 - (ii) The proposed power density levels are in excess of those specified in §25.134, §25.211, or §25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, whichever is applicable.
- (2) Paragraphs (b) through (e) and (g) of this section apply to the earth station applications described in paragraph (a)(1) of this section, in which the applicant seeks transmit/receive authority.
- (3) Paragraphs (f) and (g) of this section applies to the earth station applications described in paragraph (a)(1) of this section in which the applicant seeks transmit-only or receive-only authority.
- (4) The requirements for petitions to deny applications filed pursuant to this section are set forth in § 25.154.

(b) If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its FCC Form 312 application, the antenna gain patterns specified in §25.132(b).

(c) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must meet the requirements of either paragraph (c)(1) or (c)(2) of this section to obtain authority to transmit. The applicant must meet the requirements of paragraph (c)(3) of this section to obtain protection from receiving interference from adjacent satellite operators.

(1) The applicant must provide in its Form 312, Schedule B, the power and power density levels that result by reducing the values stated in §§ 25.134, 25.211, or 25.212, whichever is applicable, by the number of decibels that the non-compliant antenna fails to meet the antenna performance standard of §25.209(a) and (b), or

(2) The applicant will not be permitted to transmit to any satellite unless the applicant has provided the certifications listed in paragraph (e)(1) of this section from the operator of that satellite(s).

(3) The applicant will not receive protection from adjacent satellite interference from any satellite unless the applicant has provided the certifications listed in paragraph (d)(1) of this section from the operator of that satellite(s) from which it plans to receive.

(d)(1) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must submit the certifications listed in paragraphs (d)(1)(i) through (d)(1)(iv) of this Section to qualify for protection from receiving interference from other satellite systems. The applicant will be granted protection from receiving interference only with respect to the satellite systems included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section, and only to the extent that protection from receiving interference is afforded by those coordination agreements.

(i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to receive interference from adjacent satellite networks that may be unacceptable.

(ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming earth station accessing its satellite(s), including its required downlink power density based on the information contained in the application, with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will operate in conformance with existing coordination agreement for its satellite(s) with other satellite systems.

(iii) A statement from the satellite operator that it will include the subject non-conforming earth station operations in all future satellite network coordinations, and

(iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (d)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall accept the power density levels that would accommodate the 2° compliant satellite.

(e)(1) An earth station applicant proposing to use transmitted satellite carrier EIRP densities, and/or maximum power into the antenna in excess of the levels in §§25.134, 25.211, 25.212, or the power density levels derived through the procedure set forth in paragraph (c)(1) of this section, whichever is applicable, shall provide the following certifications as an exhibit to its earth station application:

- (i) A statement from the specified satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to create interference to adjacent satellite networks that may be unacceptable.
- (ii) A statement from the specified satellite operator that it has coordinated the operation of the subject non-conforming Earth Station accessing its satellite(s), and its corresponding downlink power density requirements (based on the information contained in the application) with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will not violate any existing coordination agreement for its satellite(s) with other satellite systems.
- (iii) A statement from the specified satellite operator that it will include the subject non-conforming Earth Station power and power densities in all future satellite network coordinations, and
- (iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (e)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall reduce its power to those levels that would accommodate the 2° compliant satellite.

(f)(1) If an earth station applicant requests transmit-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (c) of this section.

(2) If an earth station applicant requests transmit-only authority, and its proposed power density levels are in excess of those specified in §§25.134, 25.211, or 25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, it must meet the requirements of paragraph (e) of this section.

(3) If an earth station applicant requests receive-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (d) of this section.

(g) Applicants filing applications for earth stations pursuant to this section must provide the following information for the Commission's public notice:

- (1) Detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellites with which it plans to operate, or the eastern and western boundaries of the geostationary satellite orbit arc it plans to coordinate.
- (2) The diameter or equivalent diameter of the antenna.
- (3) Proposed power and power density levels.
- (4) Identification of any rule or rules for which a waiver is requested.

23. In § 25.271, add paragraph (c)(5) to read as follows:

§25.271 Control of transmitting earth stations.

* * * * *

(c) * * *

(5) International VSAT system operators are required to maintain a control point within the United States, or to maintain a point of contact within the United States available 24 hours a day, 7 days a week, with the ability to shut off any earth station within the VSAT network immediately upon notification of harmful interference.

* * * * *

24. In § 25.274, revise paragraph (e), remove paragraph (g), redesignate paragraph (f) as new paragraph (g), and add new paragraph (f) to read as follows:

§25.274 Procedures to be followed in the event of harmful interference.

* * * * *

(e) The earth station licensee whose operations are suspected of causing harmful interference to the operations of another earth station shall take reasonable measures to determine whether its operations are the source of the harmful interference problem. Where the operations of the suspect earth station are the source of the interference, the licensee of that earth station shall take all measures necessary to resolve the interference.

(f) Where the earth station suspected of causing harmful interference to the operations of another earth station cannot be identified or is identified as an earth station operating on a satellite system other than the one on which the earth station suffering harmful interference is operating, it is the responsibility of a representative of the earth station suffering harmful interference to contact the control center of other satellite systems. The operator of the earth station suffering harmful interference is free to choose any representative to make this contact, including but not limited to the operator of the satellite system on which the earth station is operating. The operator of the earth station suffering harmful interference is also free to contact the control center of the other satellite systems directly.

* * * * *

25. Amend § 25.277 by revising paragraph (d) and adding paragraph (f) to read as follows:

§25.277 Temporary fixed earth station operations.

* * * * *

(d) Except as set forth in Section 25.151(e) of this chapter, transmissions may not be commenced until all affected terrestrial licensees have been notified and the earth station operator has confirmed that unacceptable interference will not be caused to such terrestrial stations.

* * * * *

(f) Filing requirements concerning applications for new temporary fixed earth station facilities operating in frequency bands shared co-equally with terrestrial fixed stations.

(1) When the initial location of the temporary fixed earth station's operation is known, the applicant shall provide, as part of the Form 312 application, a frequency coordination report in accordance with §25.203 for the initial station location.

(2) When the initial location of the temporary fixed earth station's operation is not known at the time the application is filed, the applicant shall provide, as part of the Form 312 application, a statement by the applicant acknowledging its coordination responsibilities under §25.277.

APPENDIX C

Summary of ASIA Analysis of 10, 13, and 16 dBW/4kHz Downlink EIRP Densities

I. Introduction

Sections 25.134(a) and 25.212(c) set a 6 dBW/4kHz criteria on the maximum Ku-band¹ downlink EIRP density² that can be routinely processed. A number of comments support increasing this downlink EIRP density criteria for the routine processing of earth station applications. Most commenters support increasing this criteria to 9 dBW/4kHz, and some commenters support increasing this criteria to 10 dBW/4kHz. The proposed 9 or 10 dBW/4kHz criteria would apply to all wideband and narrowband digital services. Other commenters propose the creation of a new routine processing criteria for wideband and dual carrier per transponder digital services. Criteria at both 13 dBW/4kHz and 16 dBW/4kHz have been proposed for these wideband and dual carrier per transponder services.

In this appendix, we summarize our examination of the interference impact of raising the downlink EIRP density criteria for routine processing. Based on those comments, as supplemented by our analysis summarized in this appendix, we conclude that increasing the Ku-band downlink EIRP density limit to 10 dBW/4kHz is consistent with the Commission's 2° spacing satellite technical standards. Our full analysis is included in the docket file for this proceeding and is publicly available.

The 6 dBW/4kHz routine processing criteria was originally established in the *1986 VSAT Order*³ and applied only to digital VSAT networks with outbound gross bit rates up to 3.088 Mbps. In the *1996 Streamlining Order*,⁴ this downlink EIRP density criteria was extended to all Ku-band digital transmissions, regardless of bandwidth or bit rate.

In 1985 and 1986, a number of VSAT earth station network applications were pending.⁵ These applications proposed a variety of antenna sizes, data rates, uplink power density levels, and downlink EIRP density levels.⁶ At that time, the Commission's interference analysis found that the highest downlink power density levels could cause excessive levels of interference into existing services⁷ and accordingly limited the downlink EIRP density for routine processing to 6 dBW/4kHz.

¹ Specifically, the downlink EIRP density limit being considered here applies only in the 11.7-12.2 GHz band.

² The 6 dBW/4kHz downlink EIRP density criteria applies only to the routine processing of wideband and narrowband digital services.

³ Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, *Declaratory Order*, Common Carrier Bureau, Released Apr. 9, 1986 (*1986 VSAT Order*).

⁴ Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581 (1996) (*1996 Streamlining Order*).

⁵ *1986 VSAT Order* at n. 2.

⁶ *1986 VSAT Order* at para. 9. The highest downlink EIRP density proposed was +10.3 dBW/4kHz.

⁷ *1986 VSAT Order* at para. 15.

In order to assess the interference impact of raising this routine processing criteria to levels greater than 6 dBW/4kHz, the staff has preformed an ASIA⁸ analysis using a series of baseline systems. **First**, an outbound digital VSAT reference system with 5.0 and 1.2 meter antennas operating at the routine processing levels of §25.134(a) and §25.212(c) was considered. This reference system consists of six (6) carrier links at both 6 dBW/4kHz and 10 dBW/4kHz downlink EIRP density levels⁹. **Second**, a narrowband analog reference system, with 5.0 and 1.2 meter antennas operating at the routine processing levels of §25.134(a) and §25.212(c) was also defined. This narrowband analog system consists of eight (8) carrier links providing audio program and voice grade circuits at both downlink EIRP density levels of 13 dBW/4kHz and 17.0 dBW/4kHz.¹⁰ **Third**, a generic reference system of general communications carrier links was also considered. This system consists of 107 generic Ku-band carrier links. Some of these generic links were originally analyzed in Appendix C of the 1983 *Two Degree Spacing Order*¹¹ and later, these generic links were adjusted to include the domestic space station applications filed on November 7, 1983. These generic links were used in the staff's original analysis in the *1986 VSAT Order*. The set of 107 generic links considered in this appendix is a revised version of those generic links used in the *1986 VSAT Order*. Those used in the *1986 VSAT Order* were reviewed and several obsolete links were removed.¹² Additionally a few new links from a recent space station application¹³ were added to this set to complete the 107 generic links used in the analyses in this appendix.¹⁴ Note that the receive satellite antenna gain and downlink EIRP levels for these generic links are generally characteristic of nominal edge of coverage.¹⁵ **Fourth**, a set of baseline digital carriers, both wideband and narrowband, operating at the routine processing levels of §25.212(c) was considered. This baseline digital system consists of twelve carrier links

⁸ The Adjacent Satellite Interference Analysis (ASIA) computer program and interference assessment methodology is cited in Section 25.134(b) of our Rules. The ASIA program and methodology was originally employed to analyze the impact of 2° orbital spacing in the C and Ku bands in Appendices B and C of the *Two Degree Spacing Order*. Specifically, version 1.2 of ASIA was used in the analyses considered in this appendix. Version 1.2 is identical to version 1.1, with the addition of listing the computed values of power density and EIRP density. The input data used in these analyses are listed in an expanded version of this appendix available in the Docket File, in tables C-25 through C-30. Source code for ASIA, input data files, and results of these analyses will be made available on the Commission's website.

⁹ See tables C-1 and C-26 for the link parameters of the digital VSAT reference system.

¹⁰ See tables C-2 and C-27 for the link parameters of this narrowband analog reference system.

¹¹ Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, FCC 83-184, 54 Rad. Reg. 2d 577 (released Aug. 16, 1983); Licensing Space Stations in the Domestic Fixed-Satellite Service, 48 F.R. 40233 (Sept. 6, 1983) (*Two Degree Spacing Order*).

¹² The *1986 VSAT Order* generic links were adjusted by removing the following: (1) all digital non-VSAT-like BPSK links, (2) all analog FDM/FM and CSSB/AM mult-channel telephone links, (3) all narrowband analog SCPC/FM telephony links, (4) analog TV/FM distribution links to small antennas (< 3.0 meters), (5) all digital links with on-board satellite processing, and (6) links characteristic of satellite systems that were never built.

¹³ Links characteristic of three (3) satellite systems (SES Americom, Loral, and PanAmSat) were added. The link parameters for these last 16 generic links come from the ASIA analysis presented in SES Americom's space station application for Americom-9 at 79° W.L. (Attachment B to SAT-LOA-20020114-00008, S2434, filed Jan. 14, 2002). The downlink receive earth station antenna gains for the Americom 2.4 and 6.0 meter antennas have been revised. The receive gain for the 2.4 meter antennas have been changed to 47.4 dBi from 41.3, 41.8, and 49.3 dBi. The receive gain for the 6.0 meter antenna has been changed to 55.3 dBi from 49.3 dBi.

¹⁴ See tables C-3 and C-28 for the link parameters of the generic Ku band reference links.

¹⁵ Downlink EIRP levels for the generic links are generally about 3 dB lower than for the peak EIRP levels at the satellite antenna pattern's boresite.

operating at both downlink EIRP density levels of 6 dBW/4kHz and 10 dBW/4kHz¹⁶. And *fifth*, a set of baseline full and dual wideband digital carrier links operating at the routine processing levels of §25.212(c) was considered. This wideband and dual carriers per transponder baseline system consists of 24 carrier links operating at downlink EIRP density levels of 6 dBW/4kHz, 10 dBW/4kHz, 13 dBW/4kHz, and 16 dBW/4kHz.¹⁷

II. Interference Analysis Results

20% Noise Allocation to Adjacent Satellite Interference: Generally, for all but a few of the above described baseline systems,¹⁸ the single entry adjacent satellite interference objectives used in the staff's analyses in this appendix have been based upon a 20% of noise allocation to total adjacent satellite interference.¹⁹ This differs from the analyses conducted in the 1983 *Two Degree Spacing Order* and the 1986 *VSAT Order*. Before 1983, 10% of the noise budget, in most cases, was allocated to total adjacent satellite interference. With the implementation of uniform 2° orbital spacing, however, satellite operators began to increase their noise budget allocations to total adjacent satellite interference. Today the general practice is to allocate 20% of the noise budget to total adjacent satellite interference. This adjustment, while holding all other parameters constant, would allow for a 3 dB increase in uplink power density and downlink EIRP density levels²⁰ with respect to those established in the 1986 *VSAT Order*. Accordingly, this factor would allow the increase of the Ku-band downlink EIRP density criteria to 9 dBW/4kHz without causing harmful interference to most satellite systems in operation today.

Tables C-6 through C-25 summarize the results of the staff's ASIA analysis of these baseline systems.²¹ Table C-0 summarizes the result tables for the various interference cases. For example, Table C-18 provides the summary results for the Digital-to-Generic interference case and Table C-18a provides the details for those Digital-to-Generic interference cases with negative margins. Below, we discuss the conclusions we draw from the analyses. As mentioned above, the tables and the underlying data are available in the docket file for this proceeding.

¹⁶ See tables C-4 and C-29 for the link parameters of the baseline digital systems.

¹⁷ See tables C-5 and C-30 for the link parameters of the wideband and dual carriers per transponder links.

¹⁸ The last 16 links (SES Americom, Loral, and PanAmSat) in the 107 generic links are the exception. The single entry interference objectives for these links are as stated in Attachment B to the space station application, SAT-LOA-20020114-0008. See the last column of table C-28 for the single entry C/I ratio used for these last 16 links.

¹⁹ $C/I_{se} = C/N_{req} - 10 \log(0.20) - 10 \log(0.40) = C/N_{req} + 7 \text{ dB} + 4 \text{ dB} = C/N_{req} + 11 \text{ dB}$. The single entry allocation is 40% of the total adjacent satellite allocation.

²⁰ A 10% of noise allocation to adjacent satellite interference gives a C/I_{se} which is 3 dB higher than with a 20% of noise allocation. $C/I_{se} = C/N_{req} - 10 \log(0.10) - 10 \log(0.40) = C/N_{req} + 10 \text{ dB} + 4 \text{ dB} = C/N_{req} + 14 \text{ dB}$.

²¹ Negative margins in tables C-6 through C-25 are highlighted in a **bold** font. The C/I level in the worst link, either uplink or downlink, is also highlighted in a **bold** font.

Table C-0: Summary of ASIA Analysis Results (See the listed tables for results)

Victim Data Sets	Interfering Data Sets			
	Baseline VSAT (Tables C-1 & C-26)	Narrowband Analog SCPC/FM (Tables C-2 & C-27)	Baseline Digital (Tables C-4 & C-29)	Wideband & Dual Carrier (Tables C-5 & C-30)
Baseline VSAT (Tables C-1 & C-26)	Table C-6	Table C-11	Tables C-16 & C16a	Tables C-21, C-21a, C-21b, and C-21c
Narrowband Analog SCPC/FM (Tables C-2 & C-27)	Tables C-7 & C-7a	Tables C-12 & C-12a	Tables C-17 & C-17a	Tables C-22, C-22a, C-22b, and C-22c
Generic Carriers (Tables C-3 & C28)	Tables C-8 & C-8a	Tables C-13 & C-13a	Tables C-18 & C-18a	Tables C23, C-23a, C-23b, and C-23c
Baseline Digital (Tables C-4 & C-29)	Table C-9	Table C-14	Tables C-19 & C-19a	Tables C24 & C-24a
Wideband & Dual Carrier (Tables C-5 & C-30)	Table C-10	Table C-15	Tables C-20 & C20a	Tables C-25 & C-25a

A. 10 dBW/4kHz Downlink EIRP Densities:

An examination of the summary results of the staff's ASIA analyses²² indicates that very few communication links suffer negative margins from a 10 dBW/4kHz downlink EIRP density. Those cases that do experience negative margins are generally links operating at low levels of downlink EIRP density. Except for the case of narrowband analog SCPC/FM carriers, most of these links can increase their downlink EIRP density to compensate for the negative margins. Some of the analog SCPC/FM carriers that experience negative margins already operate at the routinely licensed downlink EIRP density level of 13 dBW/4kHz in §25.212. In order to recover a positive margin for these narrowband analog carriers, we have also increased their downlink EIRP density criteria by 4.0 dB to 17 dBW/4kHz. In the rest of this section, we examine the cases with negative margins in detail.

A-1. Interference into VSAT network carriers. Only link V4 has a negative margin from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C16 and C-21 from medium to wideband digital carriers. Of the nine (9) cases with a negative margin, three (3) have negative margins of -0.5 dB, five (5) have negative margins of -0.6 dB, and one (1) has a negative margin of -0.9 dB.²³ Link V4 is a VSAT link between 1.2 meter antennas operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by increasing its downlink EIRP density by 1.0 dB or less.

A-2. Interference into Narrowband Analog Carriers. Two (2) narrowband analog links have negative margins from carriers operating at 10 dBW/4kHz downlink EIRP densities. These carriers are FMot and VCot with negative margins in tables C-7, C-12, C-17, and C-22. An examination of the detailed C/I ratio levels in tables C-7a, C-12a, C-17a, and C-22a shows that these analog carriers have negative margins of -3.2 dB or less for interference from digital carriers and -3.6 dB or less for interference from high-powered narrowband analog carriers. These two (2) carriers (FMot and VCot) are outbound program-quality and voice-grade circuits from 5.0 meter to 1.2 meter antennas operating at the routine analog downlink EIRP

²² See tables C-6, C-7, C-8, C-9, C-10, C-11, C-12, C-13, C-14, C-15, C-16, C-17, C-18, C-19, C-20, C-21, C-22, C-23, C-24, and C-25.

²³ See tables C-16a and C-21a for detailed C/I ratio levels.

density of 13 dBW/4kHz. In order to compensate for the shortfall in these SCPC/FM links, we have also examined the consequences of raising the routine processing level of the downlink EIRP density for narrowband analog signals. In particular, we have examined raising the downlink EIRP density limit for narrowband analog systems to 17 dBW/4kHz. This 4.0 dB downlink EIRP density increase allows these narrowband analog carriers to recover a positive margin by increasing their downlink EIRP densities.

A-3. Interference into Generic carriers. Twenty-three (23)²⁴ of the 107 generic carriers show negative margins from digital carriers operating at 10 dBW/4kHz and analog carriers operating at 17 dBW/4kHz downlink EIRP densities. In each of these cases, however, an increase in this downlink EIRP density would recover a positive margin for the carrier at issue.

A-4. Interference into Digital carriers. Only one (1) baseline digital carrier, D3-6, has a negative margin of -0.1 dB from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C-19 and C-24 from medium to wideband digital carriers. Tables C-19a and C-24a show that the shortfall for this carrier is only 0.1 dB. This carrier is operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by slightly increasing its downlink EIRP density.

A-5 Interference into Full & Dual Wideband Digital Carrier. Only one (1) wideband digital carrier, 06M1, has a negative margin of -0.1 dB from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C-20 and C-25 from medium to wideband digital carriers. Tables C-20a and C-25a show that the shortfall for this carrier is only 0.1 dB. This carrier is operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by slightly increasing its downlink EIRP density.

B. 13 dBW/4kHz Downlink EIRP Densities:

An examination of the summary results of the staff's ASIA analyses²⁵ indicates that a number of communication links suffer negative margins from a 13 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers. With respect to interference into digital VSAT carriers operating at 10 dBW/4kHz only a failure of 0.1 dB is seen for link V5 in table C-21b. With respect to narrowband analog carriers operating at 17 dBW/4kHz failures of 2.2 and 0.2 dB are seen for links FMot+ and VCot+, respectively, in table C-22b. All margins are positive for 10 dBW/4kHz carriers in table 24 (digital carriers) and table 25 (full and dual wideband digital carriers).

With respect to interference into digital VSAT carriers operating at 6 dBW/4kHz, failures of 2.7 and 3.3 dB are seen for links V2 and V4, respectively, in table C-21b. With respect to narrowband analog carriers operating at 13 dBW/4kHz failures of 0.4, 6.1, and 4.1 dB are seen for links FMin, FMot, and VCot, respectively, in table C-22b. With respect to digital carriers operating at 6 dBW/4kHz only link D3-6 fails by 3.0 dB in table C-24a. With respect to full and dual wideband digital carriers operating at 6 dBW/4kHz, links 06M1 fails by 3.0 dB in table C-25a.

With respect to interference into the generic carriers, 56 of the 107 links show a negative margin in table C-23.

C. 16 dBW/4kHz Downlink EIRP Densities:

²⁴ The carriers with negative margins in tables C-8, C-13, C-18, and C-23 are N003, N035, N036, N037, N045, N046, N052, N053, N056, N057, N058, N073, N079, N087, N092, N093, N096, N097, N101, N103, N105, N106, and N107. The following links show a failure in the tables, however they have a margin of 0.0 dB: N040.

²⁵ See tables C-21, C-22, C-23, C-24, and C-25.

An examination of the summary results of the staff's ASIA analyses²⁶ indicates that the majority of communication links suffer negative margins from 16 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers. In particular, VSAT links V2 and V4 fail by 5.4 and 6.0 dB respectively.²⁷ VSAT links V2 and V4 operate at 6 dBW/4kHz downlink EIRP density. Even increasing the downlink EIRP density to 10 dBW/4kHz for these two (2) links (V3 and V5) still causes 1.5 and 2.5 dB failures, respectively. Additionally, analog SCPC/FM links FMot and VCot fail by 9.1 and 7.1 dB, respectively.²⁸ These SCPC/FM links operate at 13 dBW/4kHz downlink EIRP density. Even increasing the downlink EIRP density to 17 dBW/4kHz for these two (2) narrowband analog links (FMot+ and VCot+) still causes 5.1 and 3.1 dB failures, respectively. Likewise, digital carrier D3-6 fails by 5.9 dB. This digital carrier operates at 6 dBW/4kHz. Even increasing the downlink EIRP density to 10 dBW/4kHz (link D3-X) still has a 2.0 dB failure.

III. Conclusion

Analysis of 10 dBW/4kHz downlink EIRP density for VSAT and other digital carriers indicates that this level is compatible with 2° orbital spacings. The 4.0 dB increase in downlink EIRP density for digital carriers, however, will also require a 4.0 dB increase in the downlink EIRP density for narrowband analog SCPC/FM to 17 dBW/4kHz. Both of these increases are compatible with 2° orbital spacings.

Analysis of 13 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers indicates that this level might require some adjustments to existing operations that presently conform to the current routine processing criteria of 6 dBW/4kHz (digital) and 13 dBW/4kHz (analog) in §25.212. Analysis of 16 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers indicates that this level is not compatible with 2° orbital spacings.

²⁶ See tables C-21, C-22, C-23, C-24, and C-25.

²⁷ See table C-21c.

²⁸ See table C-22c.

APPENDIX D

OUTLINE OF CERTIFICATION PROCEDURE

Below is a step-by-step outline of the streamlined certification procedure for non-routine earth station applications seeking authority to use smaller-than-routine antennas or higher-than-routine power levels that we adopt in Sections III.E. of this Order.

- The earth station operator decides it wants to apply for a non-routine earth station license.
- The earth station operator contacts the GSO space station operator or operators with which it wants to communicate, and asks it/them to coordinate with other potentially affected space station operators located within six degrees of the target space station operator.
- The space station operators complete their coordination negotiations, and each target space station operator provides a statement to the earth station operator certifying that the coordination negotiations have been completed.
- The earth station operator files its applications, including the following certifications as attachments:
 - (i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to create interference to adjacent satellite networks that may be unacceptable.
 - (ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming Earth Station accessing its satellite(s), and its corresponding downlink power density requirements (based on the information contained in the application) with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will not violate any existing coordination agreement for its satellite(s) with other satellite systems.
 - (iii) A statement from the satellite operator that it will include the subject non-conforming Earth Station power and power densities in all future satellite network coordinations, and
 - (iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).
- The Commission reviews the non-routine earth station application to determine whether it is acceptable for filing.
- Day 1: When the Commission completes its initial review, and if it finds that the application is acceptable for filing, the application is placed on public notice.
- Day 30: Comments are due. If the Commission receives no comments, it can act on the non-routine earth station application. If the Commission receives comments, then the 60-day coordination process is triggered. Informal comments are not sufficient to trigger this process. The commenter must identify specific target satellites, and sufficiently explain the

outstanding issues to enable the Commission to determine whether the comment is or is not frivolous.

- Day 90: The 60-day coordination process is complete. Either the target satellite operator has reached agreement with all the commenters, or the Commission can assume for purposes of the non-routine earth station application that the parties will not reach agreement. Thus, at this point, the Commission can consider all the issues to be "resolved." The Commission is not involved in these discussions.
- Day 104 (approximate): On average, within 10 business days after the end of the 60-day coordination process, the Commission will act on the earth station application. Generally, the application will be granted with respect to all target satellites that have reached agreement with all the commenters filing comments in response to that target satellite, and denied with respect to all other target satellites.

In the vast majority of cases, the Commission will allow applications to be granted with respect to target satellites for which coordination discussions have been completed, and otherwise denied. However, the Commission reserves the right to grant an application with respect to satellites with incomplete coordination agreements when the comments are frivolous, such as, for example, if someone files comments regarding a particular target satellite based on a dispute with the Commission in a different proceeding regarding a different issue and a different orbital location. The Commission also reserves the right to deny an application based on an issue it finds in its technical review, even if none of the commenters raised that issue.

APPENDIX E

FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rule Making (Notice)* and the *Further Notice of Proposed Rulemaking (Further Notice)* in IB Docket No. 00-248.² The Commission sought written public comment on the proposals in the *Notice* and *Further Notice*, including comment on the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.³

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

The Telecommunications Act of 1996 requires the Commission in every even-numbered year beginning in 1998 to review all regulations that apply to the operations or activities of any provider of telecommunications service and to determine whether any such regulation is no longer necessary in the public interest due to meaningful economic competition. Our objective is to repeal or modify any rules in Part 25 that are no longer necessary in the public interest, as required by Section 11 of the Communications Act of 1934, as amended.

We codify streamlined procedures for case-by-case examination of earth stations using "non-routine" antennas, non-routine power levels, or both. We also relax the downlink EIRP power spectral density limits for Ku-band VSAT systems. Finally, we will allow some temporary fixed earth stations to begin operation sooner than is now permitted.

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

No comments were submitted directly in response to the IRFAs in either the *Notice* or the *Further Notice*.

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

The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the rules adopted herein.⁴ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁵ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁶ A small business concern is one which: (1) is independently owned and operated;

¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Title II, 110 Stat. 857 (1996).

² 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 15 FCC Rcd 25128 (2000) (*Notice*); 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 17 FCC Rcd 18585 (2002) (*Further Notice*).

³ See 5 U.S.C. § 604.

⁴ 5 U.S.C. § 604(a)(3).

⁵ 5 U.S.C. § 601(6).

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15

(2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).⁷

1. Cable Services. The SBA has developed a small business size standard for Cable and Other Program Distribution, which consists of all such firms having \$12.5 million or less in annual receipts.⁸ According to Census Bureau data for 1997, in this category there was a total of 1,311 firms that operated for the entire year.⁹ Of this total, 1,180 firms had annual receipts of under \$10 million, and an additional fifty-two firms had receipts of \$10 million to \$24,999,999.¹⁰ Thus, under this size standard, the majority of firms can be considered small.

The Commission has developed its own small business size standard for a small cable operator for the purposes of rate regulation. Under the Commission's rules, a "small cable company" is one serving fewer than 400,000 subscribers nationwide.¹¹ Based on our most recent information, we estimate that there were 1,439 cable operators that qualified as small cable companies at the end of 1995.¹² Since then, some of those companies may have grown to serve over 400,000 subscribers, and others may have been involved in transactions that caused them to be combined with other cable operators. Consequently, we estimate that there are fewer than 1,439 small cable companies that may be affected by the proposed rules.

The Communications Act of 1934, as amended, also contains a size standard for a "small cable operator," which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than one 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."¹³ The Commission has determined that there are 67,700,000 subscribers in the United States.¹⁴ Therefore, an operator serving fewer than 677,000 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.¹⁵ Based on available data, we estimate that the number of cable operators serving 677,000 subscribers or less totals approximately 1,450.¹⁶ We do not request or collect information on whether cable operators are affiliated with entities whose gross annual revenues exceed \$250,000,000,¹⁷ and therefore are unable to estimate accurately the

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).

⁷ 15 U.S.C. § 632.

⁸ 13 C.F.R. § 121.201, NAICS code 517510.

⁹ U.S. Census Bureau, 1997 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 4, NAICS code 513220 (issued October 2000).

¹⁰ *Id.*

¹¹ 47 C.F.R. § 76.901(e). The Commission developed this definition based on its determinations that a small cable company is one with annual revenues of \$100 million or less. *See Implementation of Sections of the Cable Television Consumer Protection and Competition Act of 1992: Rate Regulation*, MM Doc. Nos. 92-266 and 93-215, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393, 7408-7409 ¶¶ 28-30 (1995).

¹² Paul Kagan Assocs., Inc., Cable TV Investor, Feb. 29, 1996 (based on figures for Dec. 30, 1995).

¹³ 47 U.S.C. § 543(m)(2).

¹⁴ *See FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, Public Notice, 16 FCC Rcd 2225 (2001).

¹⁵ 47 C.F.R. § 76.1403(b).

¹⁶ *See FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, Public Notice, 16 FCC Rcd 2225 (2001).

¹⁷ We do receive such information on a case-by-case basis only if a cable operator appeals a local

number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

2. Satellite Telecommunications. The rules proposed in this *Further Notice* would affect providers of satellite telecommunications services, if adopted. Satellite telecommunications service providers include satellite operators and earth station operators. The Commission has not developed a definition of small entities applicable to satellite operators. Therefore, the applicable definition of small entity is generally the definition under the SBA rules applicable to Satellite Telecommunications.¹⁸ This definition provides that a small entity is expressed as one with \$12.5 million or less in annual receipts.¹⁹ 1997 Census Bureau data indicate that, for 1997, 273 satellite communication firms had annual receipts of under \$10 million. In addition, 24 firms had receipts for that year of \$10 million to \$24,999,990.²⁰

3. Auxiliary, Special Broadcast and other program distribution services. 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 licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radio broadcasting stations,²¹ and television broadcasting stations.²² These definitions provide that a small entity is one with either \$6.0 million or less in annual receipts for a radio broadcasting station or \$12.0 million in annual receipts for a TV station.²³ There are currently 3,237 FM translators and boosters, 4913 TV translators.²⁴ 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 \$6.0 million for a radio station or \$12.0 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.

4. Microwave Services. Microwave services include common carrier,²⁵ private-operational fixed,²⁶ and broadcast auxiliary radio services.²⁷ At present, there are

franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. See 47 C.F.R. § 76.990(b).

¹⁸ "This industry comprises establishments primarily engaged in providing point-to-point telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications." Small Business Administration, NAICS code 517310.

¹⁹ 13 C.F.R. § 120.121, NAICS code 517310.

²⁰ U.S. Census Bureau, 1997 Economic Census, Subject Service: Information, "Establishment and Firm Size," Table 4, NAICS 513340 (Issued Oct. 2000).

²¹ 13 CFR § 121.201, NAICS code 515112.

²² 13 CFR § 121.201, NAICS code 515120.

²³ 13 C.F.R. § 121.201.

²⁴ FCC News Release, Broadcast Station Totals as of September 30, 1999, No. 71831 (Jan. 21, 1999).

²⁵ See 47 CFR § 101 *et seq.* (formerly, part 21 of the Commission's Rules).

²⁶ Persons eligible under parts 80 and 90 of the Commission's rules can use Private Operational-

approximately 22,015 common carrier fixed licensees and 61,670 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. The Commission has not yet defined a small business with respect to microwave services. For purposes of this FRFA, we will use the SBA's definition applicable to cellular and other wireless communications companies -- *i.e.*, an entity with no more than 1,500 persons.²⁸ We estimate that all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition for radiotelephone (wireless) companies.

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

The rules adopted in this *Fifth Report and Order* are not intended to increase the reporting, record keeping and other compliance requirements of any licensee, and we do not anticipate any differential treatment to be received by larger and smaller entities. The reporting requirements we adopt in this *Fifth Report and Order* generally replace the more burdensome Adjacent Satellite Interference Analysis (ASIA) requirement. These requirements will not affect small businesses differently from other non-routine earth station applicants.

Specifically, instead of the more burdensome ASIA requirement, non-routine earth station applicants under the new rules will be required to provide the following information: (1) A detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellite(s) with which it plans to operate, or the eastern and western boundaries of the arc it plans to coordinate. (2) The diameter or equivalent diameter of the antenna. (3) Proposed power and power density levels. (4) Identification of any random access technique, if applicable. (5) Identification of a specific rule or rules for which a waiver is requested.

In addition, non-routine earth station applicants choosing to use the certification procedure will be required under the new rules to provide certifications showing that the satellite operators with whom they plan to communicate have coordinated their operations with adjacent satellite operators.

Finally, all earth station applicants planning to operate in government/non-government frequency bands must provide information on half-power beam width of the earth station antenna under the new rules.

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

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the

Fixed Microwave services. *See* 47 CFR parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee's commercial, industrial, or safety operations.

²⁷ Auxiliary Microwave Service is governed by part 74 of Title 47 of the Commission's Rules. *See* 47 CFR part 74 *et seq.* Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

²⁸ *See* 13 CFR § 121.201, NAICS code 517212.

establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.²⁹

This *Fifth Report and Order* adopts procedures that will allow faster and easier processing of non-routine earth station applications. One of the proposals adopted here is to license non-routine earth station operators upon a showing that they will lower their power levels to reduce the potential for harmful interference. The Commission specifically considered and rejected a proposal to require such earth station operators to provide certifications that their non-routine operations have been coordinated with adjacent satellite operators. Requiring certifications in addition to power reductions, instead of as an alternative to power reductions, would have been more burdensome to all earth station operators, including those that are small entities. Thus, rejection of that proposal benefits all earth station applicants, including small entities.

In this *Fifth Report and Order*, the Commission also increases the downlink EIRP power spectral density limits for Ku-band VSAT systems. One alternative was to keep the previous power spectral density limits. The Commission rejected that alternative because increasing the power limit increases flexibility and thus decreases regulatory burdens for all VSAT network operators, including small VSAT network operators.

Finally, in this *Fifth Report and Order*, the Commission adopts rules allowing routine Ku-band temporary-fixed earth station operators to begin operation sooner than is now permitted. One alternative was to keep the previous requirements, which prohibited all temporary-fixed earth station operators from operating before the end of a notice-and-comment period. The Commission rejected that alternative because allowing earlier operation decreases regulatory burdens for all routine Ku-band temporary-fixed earth station operators, including small earth station operators falling in this category.

F. Report to Congress

The Commission will send a copy of the *Fifth Report and Order*, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A). In addition, the Commission will send a copy of the *Fifth Report and Order*, including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the *Fifth Report and Order* and FRFA (or summaries thereof) will also be published in the Federal Register. *See* 5 U.S.C. § 604(b).

²⁹ 5 U.S.C. §§ 603(c)(1) – (c)(4).