

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

In the matter of)	
)	
Amendment of Parts 2 and 25 of the)	ET Docket No. 98-206
Commission’s Rules to Permit Operation of)	RM-9147
NGSO FSS Systems Co-Frequency with GSO and)	RM-9245
Terrestrial Systems in the Ku-Band Frequency)	
Range;)	
)	
Amendment of the Commission’s Rules to)	
Authorize Subsidiary Terrestrial Use of the)	
12.2-12.7 GHz Band by Direct Broadcast Satellite)	
Licensees and Their Affiliates; and)	
)	
Applications of Broadwave USA, PDC Broadband)	
Corporation, and Satellite Receivers, Ltd. to)	
Provide a Fixed Service in the 12.2-12.7 GHz)	
Band)	

FOURTH MEMORANDUM OPINION AND ORDER

Adopted: April 22, 2003

Released: April 29, 2003

By the Commission: Commissioner Martin approving in part, dissenting in part, and issuing a statement.

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I. INTRODUCTION

1. In this *Fourth Memorandum Opinion and Order (Fourth MO&O)*, we address the petitions for reconsideration filed in response to the report and order portion of the *Memorandum Opinion and Order and Second Report and Order (Second R&O)* in this proceeding.¹ In the *Second R&O*, the Commission adopted technical rules and procedures for spectrum sharing between Multichannel Video Distribution and Data Service (MVDDS) and Direct Broadcast Satellite (DBS) service as well as between MVDDS and Non-geostationary Satellite Orbit Fixed-Satellite Service (NGSO FSS). The Commission also adopted MVDDS service rules that set forth the licensing plan, technical rules, and competitive bidding procedures, in addition to application and licensing requirements, governing MVDDS operation in the 12.2-12.7 GHz band. Finally, the Commission dismissed the pending applications of Broadwave Network, LLC (Northpoint), PDC Broadband Corporation (Pegasus), and Satellite Receivers, Ltd. (SRL), for licenses to provide MVDDS. We deny the petitions for reconsideration to the extent discussed below and otherwise affirm or clarify the decisions made in the *Second R&O*.

II. EXECUTIVE SUMMARY

2. In acting on the petitions for reconsideration filed in response to the *Second R&O*, we make the following major determinations:

- We affirm the MVDDS/DBS rules and procedures adopted in the *Second R&O* and affirm our finding that they will protect DBS against harmful interference from MVDDS and will preserve the primary allocation status of DBS.
- We find that the rules and procedures adopted in the *Second R&O* to protect DBS do not violate any provisions of the *Rural Local Broadcast Signal Act (RLBSA)*, the *Satellite Home Viewer Improvement Act (SHVIA)*, and the *LOCAL TV Act* that seek to prohibit harmful interference to DBS.
- We affirm the Commission's interpretation of Section 1012 of the *LOCAL TV Act* to not limit the field of MVDDS applicants to those entities that had an application on file at the time the statute was enacted.
- We affirm the dismissal of the applications to provide terrestrial services filed by Northpoint, Pegasus and SRL.

¹ *Memorandum Opinion and Order and Second Report and Order*, FCC 02-116, ET Docket No. 98-206, 17 FCC Rcd 9614 (2002). (*Second R&O*).

- We affirm the MVDDS/NGSO FSS technical rules and coordination requirements adopted in the *Second R&O*.

III. BACKGROUND

3. In November 1998, the Commission released a notice of proposed rulemaking in this proceeding that proposed to permit NGSO FSS operations in certain segments of the Ku-band.² NGSO FSS can provide a variety of new services to the public, such as high-speed Internet and on-line access, plus other types of high-speed data, video and telephony services. In the *November 24, 1998 NPRM*, the Commission proposed to allow NGSO FSS operations to use the 10.7-12.7 GHz band for NGSO downlinks on a co-primary basis and to use the 12.75-13.25 GHz and 13.8-14.5 GHz bands for NGSO uplinks on a co-primary basis.³ Among other matters, the *November 24, 1998 NPRM* also asked for comments on a Petition for Rulemaking filed by Northpoint Technology, Ltd. (Northpoint) that proposed to provide terrestrial retransmission of local television signals and data services in the 12.2-12.7 GHz band⁴ which is used by the Broadcast Satellite Service (BSS)⁵ and is one of the bands in which the Commission proposed to authorize NGSO FSS operations.

4. On November 29, 1999, the *Satellite Home Viewer Improvement Act (SHVIA)* was enacted.⁶ The *SHVIA* legislation generally seeks to place satellite carriers on equal footing with local cable operators concerning the availability of broadcast programming, and thus is intended to give consumers more and better choices in selecting a multichannel video programming distributor (MVPD).⁷ In addition to the 1999 *SHVIA* legislation, Congress passed a provision entitled the *Rural Local Broadcast Signal Act (RLBSA)*.⁸ Among other things, this law required the Commission to make a determination by November 29, 2000, regarding licenses or other authorizations for facilities that will utilize, for delivering local broadcast television signals to satellite television subscribers in unserved and underserved local television

² 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; Amendment of the Commission's Rules to authorize subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates, *Notice of Proposed Rulemaking (November 24, 1998 NPRM)*, ET Docket No. 98-206, 14 FCC Rcd 1131 (1998). The Ku-band is generally defined as frequencies in the 12-18 GHz range.

³ Except for the 12.2-12.7 GHz band, all of the bands proposed for NGSO FSS were already allocated to the FSS on a primary or co-primary basis. The *November 24, 1998 NPRM* proposed a co-primary allocation for NGSO FSS in the 12.2-12.7 GHz band.

⁴ Northpoint Petition, RM-9245, filed March 6, 1998.

⁵ In the U.S. the BSS is synonymous with DBS. In this proceeding we use these terms interchangeably.

⁶ See *SHVIA*, Title I of the Intellectual Property and Communications Omnibus Reform Act of 1999 (IPACORA), relating to copyright licensing and carriage of broadcast signals by satellite carriers, codified in scattered sections of 17 and 47 U.S.C.). See generally, *Implementation of the Satellite Home Viewer Improvement Act of 1999: Application of Network Nonduplication, Syndicated Exclusivity, and Sports Blackout Rules to Satellite Retransmissions*, CS Docket No. 00-2, *Report and Order*, 15 FCC Rcd 21688 (2000), *Order on Reconsideration*, 17 FCC Rcd 20,693 (2002); *Implementation of the Satellite Home Viewer Improvement Act of 1999*, CS Docket No. 99-363, *First Report and Order*, 15 FCC Rcd 5445 (2000), *Order on Reconsideration*, 16 FCC Rcd 15599 (2001).

⁷ See *1999 SHVIA Implementation NPRM*, 14 FCC Rcd at 21736 ¶ 1. The MVPD definition includes cable operators, multichannel multipoint distribution service, DBS service, television receive-only satellite program distributors, video dialtone service providers, and satellite master antenna television service providers that make available for purchase, by subscribers or customers, multiple channels of video programming. See 47 C.F.R. § 76.905(d).

⁸ Act of Nov. 29, 1999, Pub. L. 106-113, 113 Stat. 1501, 1501A-544 to 1501A-545 (enacting S. 1948, Title II of the IPACORA).

markets, spectrum otherwise allocated to commercial use.⁹ The *RLBSA* legislation also requires that the Commission ensure that no facility licensed or authorized to deliver such local broadcast television signals “causes harmful interference to the primary users of that spectrum or to public safety spectrum use.”¹⁰

5. On November 29, 2000, the Commission adopted the *First R&O* and *Further Notice* in the subject proceeding.¹¹ Among other decisions in the *First R&O*, the Commission made the threshold finding that MVDDS can operate in the 12.2-12.7 GHz band under the existing primary Fixed Service (FS) allocation without causing harmful interference to incumbent BSS operations.¹² The Commission also decided to permit NGSO FSS to operate service downlinks on a co-primary basis with DBS and MVDDS in the same band.¹³ At present the 12.2-12.7 GHz band is used by DBS under the primary BSS allocation. With the *Further Notice*, the Commission set in motion the final regulatory process for licensing MVDDS. In light of these determinations, the Commission concluded that it had met the deadline for action set forth in the *RLBSA*.

6. Furthermore, the Commission concluded that it would define MVDDS technical rules and requirements in a later order that would protect BSS operations and that it could establish criteria that would permit MVDDS/NGSO FSS sharing. To that end, the Commission sought detailed comment in the *Further Notice* regarding the technical sharing criteria between MVDDS and BSS and NGSO FSS, and on the MVDDS service, technical and licensing rules under Part 101 of the Commission's Rules. Finally, the Commission requested comment on the disposition of the pending 12 GHz applications filed by Northpoint, Pegasus, and SRL.

7. On December 21, 2000, Congress enacted Section 1012, *Prevention of Interference to Direct Broadcast Satellite Services*, of the Commerce, Justice, State and Judiciary Appropriations Act, H.R. 5548.¹⁴ Section 1012 required the Commission to arrange for independent testing of “any terrestrial service technology proposed by any entity that has filed an application to provide terrestrial service” in the 12 GHz band. The Commission selected The MITRE Corp. (MITRE) to conduct this testing. MITRE filed its report detailing its testing on April 18, 2001.¹⁵

⁹ *Id.* While this provision does not identify the 12 GHz band specifically, MVDDS is one alternative to satisfy this demand in rural and underserved local television markets. *See also*, Letter from Senator Ted Stevens, *et al.*, Committee on Commerce, Science, and Transportation to Chairman, William E. Kennard, Federal Communications Commission, dated July 27, 2000.

¹⁰ Act of Nov. 29, 1999, Pub. L. 106-113, 113 Stat. 1501, 1501A-544 to 1501A-545.

¹¹ 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 Rule Making*, FCC 00-418, ET Docket No. 98-206, 16 FCC Rcd 4096 (2000) (*First R&O* and *Further Notice*).

¹² *Id.*

¹³ *Id.* A service downlink is a data link from a satellite to an earth station which carries radio communications other than tracking, telecommand and control signals.

¹⁴ Launching Our Communities' Access to Local Television Act of 2000 ("LOCAL TV Act"), Pub. L. No. 106-553, § 1012 (entitled "Prevention of Interference to Direct Broadcast Satellite Services"), 114 Stat. 2762, 2762A-344 (2000).

¹⁵ The MITRE Corporation, “Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band” (filed April 18, 2001) (MITRE Report). The Commission placed the MITRE Report on public notice on April 23, 2001. Comments responsive to the study were due on May 15, 2001 and replies were due on May 23, 2001.

8. On April 11, 2002, the Commission adopted the *Memorandum Opinion and Order and Second Report and Order (Second R&O)* in this proceeding.

9. Six parties filed petitions for reconsideration of the *Second R&O*, three parties filed oppositions to these petitions, and seven parties filed replies/comments.¹⁶ In addition, appeals of the *Second R&O* have been filed with the circuit court of appeals for the District of Columbia in this proceeding.¹⁷

IV. DISCUSSION

A. DBS Issues

10. In the memorandum opinion and order portion of the *Second R&O*, the Commission concluded that the decision to authorize MVDDS in the 12 GHz band met the rule making requirements of the *Administrative Procedure Act (APA)*.¹⁸ The Commission found that the decision to authorize MVDDS to share the 12 GHz band complies with the harmful interference prevention requirements and legislative intent of the *Rural Local Broadcast Signal Act (RLBSA)* and *Satellite Home Viewer Improvement Act (SHVIA)*.¹⁹ The Commission found that the decision to authorize MVDDS in the 12 GHz band instead of alternative frequency bands was carefully considered and rationally explained based upon all the available information in the record.²⁰ The Commission affirmed that MVDDS is authorized on a primary, rather than secondary, basis under the existing primary FS allocation for the 12 GHz band but must protect DBS from harmful interference.²¹ The Commission concluded that the adopted rules would limit the interference potential from MVDDS to a level that does not rise to harmful interference under our rules.²² In the absence of harmful interference from MVDDS, the Commission found that the primary or co-primary status of either DBS or NGSO FSS would not be derogated.²³ The Commission found that the MVDDS rules are technologically neutral.²⁴ The Commission noted that the DBS/NGSO FSS unavailability allowances described in ITU Recommendation ITU-R BO.1444 are inappropriate for MVDDS.²⁵ The Commission dismissed, as untimely, a petition for consolidation filed by EchoStar and DIRECTV that urged us to declare other frequency bands available for MVDDS in lieu of the 12.2-12.7 GHz band.²⁶ The Commission found that the petition, although styled as a petition to

¹⁶ A list of the parties filing petitions, oppositions, replies and comments is provided in Appendix A.

¹⁷ Northpoint and Pegasus, among others, have filed appeals challenging our decisions in the *Second R&O* that are currently pending with the D.C. Circuit Court of Appeals (D.C. Court Docket No. 02-1194). The Court has consolidated these cases and, pursuant to a motion filed by the Commission, is holding the cases in abeyance pending our action herein on the Pegasus petition for reconsideration.

¹⁸ *Second R&O* at ¶¶ 14-16.

¹⁹ *Id.* at ¶¶ 17-24.

²⁰ *Id.* at ¶¶ 25-36.

²¹ *Id.* at ¶¶ 26 and 28.

²² *Id.* at ¶ 19. 47 C.F.R. Section 2.1 defines *harmful interference* as “... interference which ... seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service ...”

²³ *Second R&O* at ¶ 26.

²⁴ *Id.* at ¶ 39.

²⁵ *Id.* at ¶ 41.

²⁶ *Id.* at ¶ 48.

consolidate three rulemaking proceedings, essentially asked us to reconsider our threshold decision in the *First R&O* to authorize MVDDS in the 12 GHz band.²⁷

11. In the report and order portion of the *Second R&O*, the Commission developed requirements that it concluded would limit the amount of increased DBS unavailability due to the presence of MVDDS. DBS satellites are designed to provide very reliable service with typical service availabilities on the order of 99.8-99.9%.²⁸ Thus unavailability or service outage generally ranges from 0.1-0.2%. This small amount of unavailability primarily occurs during heavy rain events due to DBS signal fading. In the *Second R&O*, using a prescribed methodology, the Commission predictively modeled, for various areas, rain rates and the amount of outage a typical DBS subscriber could expect to incur in any given year. Using that as a baseline, the Commission developed criteria that would limit the amount of increased DBS unavailability due to the presence of MVDDS to a negligible level.²⁹ The Commission decided that the best means of controlling any effect of MVDDS on DBS would be by limiting the equivalent power flux density (EPFD) of an MVDDS transmit signal at a DBS receiver. Using an increase of 10% DBS unavailability as a starting point,³⁰ the Commission developed rules that provide for four regional EPFD limits that MVDDS providers are required to meet.³¹ The Commission adopted a maximum power limit of 14 dBm per 24 megahertz Effective Isotropic Radiated Power (EIRP) for MVDDS.³² The Commission specified an EPFD limit for each of four regions across the United States.³³ The regions and corresponding EPFD limits are: East: -168.4 dBW/m²/4kHz, Midwest: -169.8 dBW/m²/4kHz, Southwest: -171.0 dBW/m²/4kHz, and Northwest: -172.1 dBW/m²/4kHz.³⁴ The Commission decided that the unavailability allowance ascribed to MVDDS is in addition to the unavailability allowance ascribed to NGSO FSS operations in the 12.2-12.7 GHz band.³⁵ Finally, because the Commission recognized that there could be anomalous situations, the Commission adopted a “safety valve” by which we will consider requests to adjust the EPFD for specific locations should a DBS provider demonstrate a tangible detrimental impact on DBS caused by MVDDS operations.³⁶

12. In addition, the Commission decided that MVDDS providers must site and design transmitting antennas to avoid causing harmful interference to existing DBS customers of record.³⁷ The Commission required the MVDDS operator to ensure that the prescribed EPFD limits are not exceeded at any DBS customer of record location, and to conduct a survey of the area around their proposed transmitting antenna site to determine the location of all DBS customers who may potentially be affected by the introduction of the MVDDS service.³⁸ The Commission required the MVDDS operator to notify

²⁷ *Id.* at ¶ 48.

²⁸ *Id.* at Appendix G

²⁹ *Id.* at ¶ 68.

³⁰ *Id.* at ¶ 68.

³¹ *Id.* at ¶¶ 68, 83.

³² *Second R&O* at ¶ 68.

³³ *Id.* at ¶¶ 68, 83.

³⁴ *Id.* at ¶ 83.

³⁵ *Id.* at ¶ 77.

³⁶ *Id.* at ¶ 83.

³⁷ *Id.* at ¶ 88. DBS customers of record are those who had their DBS receive antennas installed prior to or within the 30 day period after notification to the DBS operator by the MVDDS licensee of the proposed MVDDS transmitting antenna site. See 47 CFR § 101.1440(a).

³⁸ *Id.* at ¶ 89-90. See also rule section 101.1440 (“MVDDS protection of DBS”) which outlines the procedures an MVDDS entity is to follow to protect DBS customers prior to operating a transmitter.

the DBS providers of the operational characteristics of its transmitter, service area and site survey results at least 90-days prior to commencement of transmission from their facility (“coordination notification”).³⁹ The Commission required the DBS providers, no later than 45 days after receiving the coordination notification, to identify any new subscribers that signed up within 30 days after the receipt of the MVDDS notice and any areas where the DBS providers believes that the EPFD values may be exceeded.⁴⁰ The Commission required that the MVDDS licensee must satisfy all complaints of interference caused to a DBS customer of record which are received during a one year period⁴¹ after commencement of operation of the MVDDS transmitting facility or cease operation if it is demonstrated that the DBS customer is receiving harmful interference from MVDDS or if the MVDDS signal exceeds the permitted EPFD levels at the DBS customer location.⁴²

13. Concerning new DBS customers who subscribe after the commencement of MVDDS operation in a given area, the Commission also found that those new DBS customers could take modest self-mitigation measures such as siting and shielding or using larger receive antennas to account for the presence of an MVDDS signal.⁴³ Because such steps are simple, effective and consistent with existing DBS installation practices, the Commission concluded that it is reasonable to expect DBS licensees to incorporate the presence of an MVDDS signal into their installation guidelines for new DBS customers.⁴⁴

1. Legal Authority and Regulatory Status

a. Compliance with Statutes and Rules

14. *Positions of the Parties.* EchoStar Satellite Corporation and DIRECTV, Inc. (EchoStar and DIRECTV), Satellite Broadcasting and Communications Association (SBCA), and SES Americom, Inc. (SES Americom) assert that the MVDDS technical rules the Commission adopted are unlawful because they do not protect the DBS service from harmful interference as required by various Congressional mandates and the Commission’s own rules. In particular, the petitioners allege that our technical rules violate the provisions of the *Rural Local Broadcast Signal Act (RLBSA)* and the *Satellite Home Viewer Protection Act (SHVIA)*⁴⁵ that prohibit harmful interference to DBS.⁴⁶ Petitioners argue that by using a 10% increase in unavailability as a starting point, rather than as a “ceiling,” for establishing the EPFD limits the Commission adopted, the Commission did not establish a firm limit on the amount of increased unavailability that MVDDS could cause to DBS operations.⁴⁷ Petitioners argue that the Commission thus

³⁹ *Second R&O* at ¶92.

⁴⁰ *Second R&O* at ¶92.

⁴¹ To minimize the potential for false claim reporting against MVDDS, we adopted a one-year cut off period for such complaints. *Second R&O* at ¶93.

⁴² *Second R&O* at ¶93.

⁴³ *Id.* at ¶ 92.

⁴⁴ *Id.* at ¶ 92.

⁴⁵ See footnotes 6 and 8, *Supra. Satellite Home Viewer Improvement Act Of 1999 (SHVIA)/Rural Local Broadcast Signal Act (RLBSA)*. See Pub. L 106-113, 113 STAT. 1501, 1501A-544 TO 101A-545, Act of Nov. 29, 1999 (enacting S.1948, including the SHVIA and RLBSA. Titles I and II of the Intellectual Property and Communications Omnibus Reform Act of 1999).

⁴⁶ EchoStar, DIRECTV joint petition at 2; SBCA petition at 7; SES Americom petition at 13.

⁴⁷ *E.g.*, EchoStar, DIRECTV joint petition at 5. EchoStar and DIRECTV state that they have consistently argued that the aggregate maximum increase in unavailability from all other competing uses of the 12 GHz band should be no more than 10 percent, with a limit of 2.86 percent from any one provider. They assert that even if the Commission concludes that it is permissible for an additional 10 percent increase in unavailability to be attributed to MVDDS,

(continued....)

effectively failed to define what constitutes harmful interference in a manner that can be either discerned or relied upon by DBS providers and customers. As a consequence, petitioners broadly assert that the Commission failed to comply with the cited statutes that require us to make a finding of no harmful interference to DBS. SBCA argues that this lack of definition weakens the interference protection rights of DBS customers because they will not be able to demonstrate that they are receiving harmful interference if the Commission has not identified a quantitative measure.⁴⁸ EchoStar and DIRECTV also argue that our technical rules are arbitrary and capricious because the Commission ignores prior Commission decisions that found that ubiquitous satellite and terrestrial services could not share the same band and the Commission failed to explain how the adopted technical limits would allow two such services to do so in this case.

15. EchoStar and DIRECTV, SBCA, and SES Americom also object to our decision that new DBS customers are required to take measures, on an as-needed basis, to avoid receiving harmful interference from pre-existing MVDDS transmitters. Petitioners contend that these self-mitigation responsibilities effectively render DBS secondary to MVDDS. Petitioners argue that the self-mitigation rules are unlawful because they violate the provisions of the *RLBSA* and *SHVIA* that prohibit harmful interference to DBS as well as various sections of our rules that prohibit harmful interference to the DBS service and ignore the overall 20-year history of the original DBS allocation.⁴⁹ Specifically, petitioners argue that the MVDDS/DBS sharing rules violate footnote S5.490 of the U.S. Table of Allocations concerning harmful interference caused by terrestrial radio communication services.⁵⁰ EchoStar and DIRECTV argue that the MVDDS/DBS sharing rules violate section 47 C.F.R. § 101.147(p) of our rules concerning interference caused by fixed point-to-point microwave stations.⁵¹ SBCA also argues that it is unlawful to make DBS licensees responsible for protecting DBS receivers from interference since they often don't do these installations and further that our rules will inhibit self-installation by DBS customers who might have to seek engineering guidance to protect themselves from MVDDS interference.⁵²

16. In support of these arguments, SBCA claims that our DBS implementation plan effectively limited the co-primary status of FS to five years, after which FS operations were to become secondary to DBS.⁵³ SBCA contends that the history of the DBS allocation combined with the cited rules and

(...continued from previous page)

the Commission's decision to use 10 percent as a starting point for identifying technical limits does not provide a meaningful standard. *Id.* at 6.

⁴⁸ SBCA petition at 12-13.

⁴⁹ EchoStar, DIRECTV joint petition at 3; SBCA petition at 3; SES Americom petition at 6.

⁵⁰ Footnote S5.490 states: "... in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to space services in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix S30."

⁵¹ EchoStar, DIRECTV joint petition at 3, citing 47 C.F.R. § 101.147(p) that states: "The Commission has allocated the 12.2-12.7 GHz band for use by the broadcasting-satellite service. Private operational fixed *point-to-point* microwave stations authorized after September 9, 1983, will be licensed on a non-interference basis and are required to make any and all adjustments necessary to prevent interference to operating domestic broadcasting-satellite systems." [Our emphasis herein].

⁵² SBCA cites to 47 C.F.R. § 101.1440(e) which states in pertinent part: "Beginning thirty days after the DBS licensees are notified of a potential MVDDS site under (d)(1), the DBS licensees have the responsibility of ensuring that all future installed DBS receive antennas on its system are located in such a way to as to avoid the MVDDS signal. These later installed receive antennas shall have no further rights of complaint against the notified MVDDS transmitting antenna(s)."

⁵³ SBCA petition at 4.

footnotes confirm that interference protection afforded to the DBS service is not time-limited.⁵⁴ SES Americom concurs and argues that our rules are inconsistent with the Commission's long-standing practice to ensure the continued growth and development of DBS.⁵⁵

17. SES Americom also asserts that our sharing rules and the imposition of self-mitigation responsibilities on new DBS subscribers are inconsistent with a co-primary allocation of ubiquitous services and that there is no reasonable interpretation of the U.S. Allocation Table that could justify discriminating between existing and future DBS subscribers or systems.⁵⁶ SES Americom further argues that, while a "first-come, first-served" procedure is often used in order to resolve mutually exclusive proposals for discrete radio communication stations, such an approach is illogical in the context of sharing between two different consumer services, both of which depend upon blanket coverage of the same geographic regions.⁵⁷ SES Americom asserts that there is no rational basis for the contention that the service enjoys primary status if the customer base may be limited by the deployment of a second service in that region.⁵⁸ For example, if a DBS provider launches its satellite and commences service before installation of an MVDDS transmitter in a particular area, many of the DBS provider's customers (those whose receivers are installed or relocated after the MVDDS system is deployed) will be relegated to secondary status.⁵⁹ SES Americom also claims that the rules provide no meaningful restriction on the EPFD that an MVDDS transmitter can emit into a later-deployed DBS receiver and thus will hinder the introduction of competition to the incumbent providers.⁶⁰ In the case of any later-deployed DBS system, all of its customers will be subject to secondary status.⁶¹ Finally, SES Americom urges that our treatment of new DBS customers with respect to MVDDS is inexplicable when compared with the rules for sharing between DBS and NGSO FSS which are also allocated in the band on a co-primary basis.⁶²

18. Based upon the premise that future DBS subscribers will suffer harmful interference from MVDDS, SES Americom argues that the MVDDS/DBS rules are inconsistent with the ITU Radio

⁵⁴ SBCA petition at 7. SBCA particularly objects to our finding in the *Second R&O* that application of footnote S5.490 may be limited to DBS systems implemented in accordance with Appendix S30 of the ITU's radio regulations. *Id.* at 7-8 (citing *Second R&O* at footnote 216). SBCA contends that the Commission has never before in this proceeding made the non-interference obligations placed on fixed service operations in the 12 GHz band contingent upon DBS operators' strict conformance with Appendix S30. Citing a 1986 *Declaratory Ruling* (Petition of United States Satellite Broadcasting Co, Inc., *Memorandum Opinion and Order*, 1 FCC Rcd, 977, 979 ¶15) on non-conforming use by DBS operators along with the planned transitioning of point-to-point FS out of the 12 GHz band, SBCA further argues that this approach taken in the *Second R&O* is inconsistent with the interpretations and policies the Commission has issued on this subject for the past 15 years and represents a *post hoc* rationalization for the decision to authorize MVDDS in the 12 GHz band. We find that SBCA's reliance on the 1986 *Declaratory Ruling* and related cases regarding protection priorities for non-conforming DBS use to be misplaced. The "non-conforming use" at issue in that case was not related to the technical sufficiency of DBS systems, but related instead to whether DBS providers in the early days of the service could provide non-DBS type programming to facilitate acceptance of the service.

⁵⁵ *Id.* at 7.

⁵⁶ SES Americom petition at 7.

⁵⁷ *Id.* at 7-8.

⁵⁸ *Id.* at 8.

⁵⁹ *Id.* at 8.

⁶⁰ *Id.* at 4-5.

⁶¹ *Id.* at 8.

⁶² *Id.* at 10. In the *First R&O* in this docket, we adopted EPFD limits for NGSO FSS systems to protect any DBS system or subscriber from interference.

Regulations and, therefore, international treaty obligations of the United States.⁶³ In support, SES Americom cites ITU Radio Regulation 342 and footnote S5.490, both of which contain prohibitions against harmful interference being caused to primary ITU allocated services.⁶⁴ SES Americom further argues that the impact of this alleged interference will not be limited to domestic DBS providers, but will also have an impact on foreign BSS Plan assignments or proposed Plan modifications that include U.S. coverage by foreign systems.⁶⁵ SES Americom argues, therefore, that the purported detrimental effect of our decisions has international ramifications.⁶⁶

19. MDS America argues in response that DBS is entitled to protection only from “harmful interference” not from all interference, even if it is measurable.⁶⁷ MDS America also argues that the DBS petitioners overlook that it is the Commission, not the DBS operators, whose role it is to define what will legally constitute “harmful interference” in accordance with the definition contained in Section 2.1 of the rules.⁶⁸ Under that definition, MDS America urges, interference is not to be deemed harmful unless it “seriously degrades, obstructs, or repeatedly interrupts” the subject service.⁶⁹ Consequently, MDS America contends, DBS service is not entitled to absolute protection from interference, and it is for the Commission to determine what constitutes serious impairment of service.⁷⁰ MDS America continues that, while the DBS petitioners may disagree with the Commission’s decision not to define harmful interference in terms of an absolute ceiling on the maximum permitted percentage of increased outage, nothing requires the Commission to adopt a definition in such terms.⁷¹ In this light, MDS America argues that the Commission may specify what interference would be deemed harmful in terms that best serve the context in which the definition would be applied – and in this case, geographic based EPFD limits were chosen.⁷² MDS America further adds that use of 10% additional unavailability as a starting point, rather than as a rigid ceiling, for developing regional EPFD levels was a reasonable approach because it does not impose percentage limitations in an arbitrary and unreasonable way when the actual minutes of increased unavailability were minimal.⁷³ MDS America also responds that the DBS petitioners’ argument—that if Private Operational Fixed Service (POFS) users were given secondary status and required to relocate to avoid interference to DBS, then the same is required of MVDDS—erroneously presumes that the services

⁶³ SES Americom petition at 11.

⁶⁴ See footnote 50 *supra*.

⁶⁵ SES Americom petition at 11. In this regard, we note that SES Americom has pending before the Commission a petition for declaratory ruling to allow it to offer DBS service to customers in the U.S. from a planned satellite to be licensed by Gibraltar, which will operate at 105.5 degrees W.L. MDS America and Northpoint, in response, assert that SES Americom would not be entitled to interference protection because the orbital slot is not included in the Region 2 Plan. *See* MDS America opposition at 3; Northpoint consolidated response at 26. We do not address here the merits of SES Americom’s argument vis-à-vis their pending petition but, rather, address their concerns more generally insofar as they raise questions about interference protection afforded any new DBS provider that is authorized to provide service in the U.S.

⁶⁶ SES Americom petition at 11.

⁶⁷ MDS America opposition to DBS petitions at 6.

⁶⁸ *Id.* at 7.

⁶⁹ *Id.* at 7.

⁷⁰ *Id.* at 7.

⁷¹ *Id.* at 8 and at footnote 18.

⁷² *Id.* at 8 and at footnote 18.

⁷³ MDS America opposition to DBS petitions for reconsideration at 10.

are similar and that MVDDS, which was not at issue when such relocation was before the Commission, must be treated the same way.⁷⁴

20. MDS America argues that the Commission's decision to grandfather a higher level of protection to DBS receivers installed within 30 days of a new or modified MVDDS transmitter reflected an appropriate balancing of inter-related policy needs and a careful review of the record.⁷⁵ MDS America suggests that adopting the SES Americom approach would subject future MVDDS operations to a "possible time bomb" [that could shut down existing MVDDS operations] depending upon what decisions a future DBS provider might make.⁷⁶ Instead, MDS America continues, the Commission reasonably, and consistent with its approach in the NGSO and other contexts, left to the DBS operators making later installations the decision as to implementation of DBS system-based mitigation techniques that would provide greater protection from MVDDS signals than that generally afforded by the Commission's technical rules restricting MVDDS operations.⁷⁷ In response to SES Americom's claim that service provided by its future DBS satellite would be subject to interference under our approach, MDS America maintains that to the extent DBS service is protected by signal strength and other technical limitations imposed on MVDDS, SES Americom is not treated differently than any other DBS operator.⁷⁸ Moreover, MDS America maintains that later-installed DBS receivers will have the ability to use improved equipment and to adjust the installation to account for potential interference from MVDDS.⁷⁹ The Commission's approach, MDS America urges, leaves to the marketplace the cost-benefit analysis with respect to additional mitigation efforts and encourages the deployment of more spectrum-efficient DBS equipment, but does not require it.⁸⁰ Finally, MDS America argues that the Commission's approach recognizes the likely tendency for DBS operators to resist new competition from MVDDS, and use claims of possible interference as a shield to prevent competitive, rather than interference, harm.⁸¹ MDS America concludes that the Commission's decision is therefore a reasoned approach to maximizing consumer choice, and thereby consumer welfare.⁸²

21. Northpoint, in response, states that the DBS industry ignores the Commission's definition of harmful interference and asserts that the DBS/MVDDS sharing rules are more than adequate to prevent anything approaching harmful interference.⁸³ Northpoint also argues that even if, *arguendo*, our sharing plan is unprecedented, it is so - not because the Commission has refused to apply its first-in-time rule to such a situation in the past; instead, it is unprecedented because the Commission has never before authorized multiple ubiquitous services using the same spectrum in overlapping areas licensed on a geographic basis.⁸⁴ Now that the Commission has done so, Northpoint asserts, it has appropriately applied its rules for co-primary use to the current situation. More specifically, Northpoint argues that a later-deployed DBS system would not be secondary to MVDDS, nor would MVDDS be secondary to a later-deployed DBS system, because the Commission has determined that terrestrial and satellite services

⁷⁴ MDS America opposition at 6.

⁷⁵ MDS America opposition at 4.

⁷⁶ *Id.* at 4.

⁷⁷ *Id.* at 4.

⁷⁸ MDS America opposition to SES Americom petition for reconsideration at 3.

⁷⁹ MDS America opposition to DBS petitions for reconsideration at 8.

⁸⁰ *Id.* at 4.

⁸¹ *Id.* at 5.

⁸² *Id.* at 5.

⁸³ Northpoint consolidated response to petitions for reconsideration at 21.

⁸⁴ Northpoint consolidated response at 27-28.

are co-primary in the 12 GHz band.⁸⁵ In that light, Northpoint urges that SES Americom does not directly challenge the validity of this principle but, instead, merely claims that the Commission's application of the principle in the context of DBS/MVDDS sharing is unprecedented.⁸⁶

22. Decision. In essence, petitioners argue two broad propositions. First, that the technical rules adopted in the *Second R&O* will result in harmful interference to DBS. Second, that such harmful interference, along with the self-mitigation responsibilities imposed on new DBS subscribers, violate applicable statutes, FCC rules, international regulations and the primary status of DBS. This assertion of harmful interference and the alleged resulting violations of various statutory and regulatory prohibitions against such harmful interference repeat some of the same arguments that were raised by petitioners against our basic threshold decision in the *First R&O* to authorize MVDDS in the 12 GHz band. The Commission denied those earlier petitions in the memorandum opinion and order portion of the *Second R&O* because the Commission rejected the central premise upon which they were based, namely that that MVDDS will cause harmful interference to DBS. We again deny the instant petitions insofar as they assert that harmful interference will be caused to DBS. EchoStar and DIRECTV also argue that the Commission disregarded prior decisions in other proceedings that sharing between two ubiquitous satellite and terrestrial services is not feasible and failed to explain why sharing in the 12 GHz band is more feasible than in other bands.⁸⁷ We dismiss this aspect of their petition as repetitious because we addressed the same question previously in the memorandum opinion and order portion of the *Second R&O* and found that the record supported our threshold decision to authorize MVDDS in the 12 GHz band.⁸⁸ As we discuss below, we also deny the instant petitions insofar as they argue that the specific technical rules adopted in the *Second R&O*, including the self-mitigation responsibilities imposed on new DBS subscribers, violate various statutes and rules.

23. As a fundamental matter, the Communications Act grants us broad statutory power to make spectrum allocation decisions.⁸⁹ Of particular relevance in this proceeding is our general authority under the Act to make decisions concerning harmful interference and to make rules for spectrum sharing between services.⁹⁰ Indeed, the overriding question upon which the Commission has sought comment throughout this proceeding has been whether MVDDS can operate in the 12 GHz band without causing harmful interference to DBS. Section 47 C.F.R. § 2.1 defines *harmful interference* as "... interference which ... seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service ..." In the *First R&O*, the Commission made the threshold finding that it was technically feasible for MVDDS to operate in the 12 GHz band without causing harmful interference to DBS. Consequently, along with the *First R&O*, the Commission simultaneously issued the *Further Notice of Proposed Rule Making* to develop specific technical criteria and rules that would achieve the twin goals of protecting DBS from harmful interference while allowing the initiation of the new MVDDS.

24. Although the statutes require that harmful interference is not caused to DBS, neither the *RLBSA* nor *SHVIA* provides a definition of harmful interference, nor does the legislative history address how this term should be construed. Given that these laws are silent on this issue, we conclude they do not

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ EchoStar, DIRECTV joint petition at 9, 10.

⁸⁸ *Second R&O* at ¶¶ 33-36 and ¶¶ 51-52.

⁸⁹ *E.g.*, 47 U.S.C. § 303. ("General Powers of Commission").

⁹⁰ In this regard, we note that the Commission's rules, in addition to defining *harmful* interference, also recognize *permissible* interference ("Observed or predicted interference which complies with quantitative interference and sharing criteria contained in these [international Radio] Regulations or in CCIR Recommendations or in special agreements as provided for in these Regulations."). *See* 47 C.F.R. § 2.1.

circumscribe our authority under the Communications Act to give meaning to the term “harmful interference” through our usual rule making procedures. That is precisely what the Commission has done through consideration of the comments and analysis of all record information in the *Second R&O*. The rules the Commission adopted are the result of that notice and comment rule making process. We disagree with petitioners' claims that the Commission acted in an arbitrary and capricious manner and contrary to law in crafting the rules at issue here. We find that these rules are reasonable based upon the record and constitute objective criteria that presumptively define DBS interference limits that are well below what could be considered harmful under our rules. Therefore, we conclude that the Commission has complied with the no-harmful-interference provisions of *SHVIA* and *RLBSA*.

25. As we explain in more detail below in addressing technical issues, the rules adopted in this proceeding will prevent harmful interference to DBS. Stated in slightly different terms, the relatively small theoretical changes in DBS unavailability or system link budget margins that might result from MVDDS operations under the rules adopted were analyzed vis-à-vis their potential to increase either the incidence or duration of service outages by a matter of minutes over a year. Quite simply, the Commission promulgated regulations that ensure that any degradation of DBS would be quite small and that the additional impact that could occur to DBS service would not amount to a serious degradation, obstruction or repeated interruption of service and thus would not be considered harmful interference under our rules.

26. We disagree with petitioners that, because the Commission used the 10 percent increase in unavailability as a guide but not a strict limit in developing EPFD limits, the Commission had not provided a meaningful limit on the amount of interference that a DBS customer may receive from MVDDS. As explained in the *Second R&O*, the Commission chose not to place a cap on the percentage increase in potential unavailability, but rather limit interference through a very conservative EPFD level. The Commission further stated that given the conservative nature of our overall approach, sound engineering judgment suggested that using a 10% increase in DBS unavailability as a strict limit is unnecessary and inappropriate given the variability that currently exists in the provision of DBS services.⁹¹ As MDS America points out, it is the Commission's role to define what will legally constitute harmful interference in accordance with the definition in Section 2.1 of the rules.⁹² MDS America further recognizes that the Commission, after weighing various factors, may choose from a variety of mechanisms to limit harmful interference.⁹³ After extensive analysis, the Commission decided that, in this case, limiting the EPFD level from an MVDDS station to a DBS receiver would be the best means of interference control. Furthermore, this approach is consistent with that required (and agreed to by the DBS licensees) for NGSO FSS sharing with DBS—*i.e.*, NGSO FSS licensees must comply with a set of EPFD levels that were developed based on technical analysis. We thus find that none of the statutory or regulatory provisions cited by petitioners supports their contention that our rules are infirm because the Commission did not impose a hard percentage-based interference limit as opposed to the objective criteria the Commission adopted.

27. As explained in the *Second R&O*, it would be impractical for an MVDDS operator to demonstrate compliance with a strict percentage criterion or an EIRP limit that would always meet a strict percentage criterion. In particular, the Commission stated that it would be extremely difficult to measure compliance of a strict percentage criterion with sufficient accuracy for meaningful enforcement.⁹⁴ The

⁹¹ *Second R&O*, Appendix G.

⁹² MDS America opposition to DBS petitions for reconsideration at 7. *See also*, 47 C.F.R. § 2.1.

⁹³ MDS America opposition to DBS petitions for reconsideration at note 18. MDS America observes that for broadcast stations, the Commission has used mileage separation to limit harmful interference between co-channel FM radio stations, but uses signal strength contours for AM radio stations.

⁹⁴ *Second R&O* at ¶ 70.

Commission noted that compliance with a percentage criterion could only be determined after the fact. The Commission used data on yearly DBS unavailability as the basis for developing additional unavailability due to MVDDS. Thus, we would need to define a reference year (*e.g.* a calendar year), measure DBS outage times, and attribute each outage or portion thereof to either natural phenomena or MVDDS. Moreover, such measurements and attributions would be required at every receiver. Only then could we determine compliance with a strict percentage increase.⁹⁵ However, at that point, it would be too late for any meaningful remedy. Further, the determination of an EPFD that would comply with a strict cap in unavailability increase would be impractical for another reason – it would require the Commission to predict in advance the yearly rainfall for a given area so that the appropriate EPFD could be determined *a priori* on a yearly basis. Clearly, even if this could be done, it would not serve either DBS or MVDDS licensees to have the regulations change on a yearly basis. Finally, if we were to adjust EPFD values to yield a cap of 10%, then it would seem reasonable to adjust the permitted EPFD limits generally upwards as DBS licensees replaced existing satellites with more powerful satellites. However, we believe such an approach would remove the incentive for DBS licensees to further mitigate the potential for interference from MVDDS by upgrading their satellite networks.⁹⁶

28. We also disagree with petitioners' claims that the Commission has not provided a meaningful restriction on the EPFD that an MVDDS transmitter can emit into a later-deployed DBS receiver. The Commission adopted a set of technical parameters (EPFD and EIRP limits) and service rules that do, in fact, limit the amount of interference that may be received by later installed DBS receivers. These parameters determine the size, shape, and orientation of the mitigation zone.⁹⁷ Because an MVDDS licensee cannot deploy unless it ensures that the EPFD is met at all DBS customers of record locations, all later installed DBS receivers gain the benefits of the choice of MVDDS operating parameters.⁹⁸ In other words, once operational, the technical parameters of an MVDDS station are known prior to the installation of any new DBS receiver and can be taken into account. To further ensure that later-installed DBS receivers can deploy, our rules do not allow the MVDDS licensee to change operating parameters without consequence. Our rules require that in the event of either an increase in the EPFD contour in any direction or a major modification to an MVDDS station, the initial requirements begin anew.⁹⁹ That is, prior to an MVDDS station making any change to its system, it must ensure that the EPFD limit is not exceeded for all DBS customers that exist at that time (this includes all DBS customers of record at the time of initial MVDDS installation plus all DBS customers added since the initial MVDDS installation). Thus, our rules do provide DBS operators with certainty and reasonable procedures.

29. Petitioners strenuously object to the imposition of self-mitigation responsibilities on DBS providers or subscribers and assert that the examples cited in the *Second R&O*, where the Commission crafted sharing rules that imposed various interference avoidance responsibilities upon existing primary services, are not precisely on point with the facts in this proceeding.¹⁰⁰ As an initial matter, we observe

⁹⁵ *Second R&O* at note 165.

⁹⁶ In fact, it was for this reason that we rejected a separate calculation of EPFD at each MVDDS site. *See Second R&O* at note 84.

⁹⁷ As described in the *Second R&O*, there is a zone around each transmitter where the EPFD has the potential to be exceeded. Within this zone, we require the MVDDS licensee to ensure that all existing DBS customers' receivers do not receive EPFDs in excess of our adopted limits. This can generally be accomplished by judicious choice of MVDDS transmitter site and antenna, but can also be accomplished through various mitigation techniques. *See Second R&O* at ¶ 55.

⁹⁸ For example, if the EPFD level is met for a customer, it is not unreasonable to assume that at a later date that customer's neighbors will also be able to install DBS receivers where the received EPFD level is below the limit specified in our rules.

⁹⁹ *See* 47 C.F.R. §§ 1.929 and 101.1440.

¹⁰⁰ *Second R&O* at ¶ 32, Footnote 77, ¶ 92, Footnote 226.

that at one level petitioners' argument essentially challenges our determination that MVDDS is allocated on a co-primary rather than secondary basis with respect to DBS.¹⁰¹ To that extent, the petitions are dismissed as repetitious because they raise the same argument about the allocation status of MVDDS (and the relative interference protection rights of DBS) that the Commission previously addressed and disposed of in the memorandum opinion and order portion of the *Second R&O*.¹⁰² In addition, we note that the examples cited in the *Second R&O* were meant to illustrate instances in the past where the Commission has imposed sharing obligations on various primary services. Whether or not the facts are precisely identical to the facts in this proceeding is irrelevant to the general proposition that the Commission has broad authority under the Communications Act to impose such requirements *ab initio*. Having made the threshold determination in the *First R&O* that it is technically feasible for MVDDS to ubiquitously share the 12 GHz band without causing harmful interference to DBS as defined by our rules, it was appropriate for us under the broad statutory powers granted by the Communications Act to craft a sharing plan through the rule making process that will enable such sharing. In that regard, we note that the adoption of any sharing rules between services, where none previously existed, inevitably results in an adjustment of the relative rights or responsibilities that licensees or subscribers of a pre-existing service must accommodate.¹⁰³ As the Commission stated in the *Second R&O*, our actions here are consistent with past Commission actions wherein the Commission has found that impacting some existing customers of a service was outweighed by the benefits of adding new services or capabilities to a frequency band.¹⁰⁴

30. In this proceeding, through the exercise of this regulatory authority, the Commission determined in the *Second R&O* that having new DBS subscribers take responsibility for modest self-mitigation measures to account for the presence of MVDDS signals strikes an appropriate balance among various spectrum policy goals. We also note, in particular, that other mitigation approaches considered in this proceeding have been consistently opposed by DBS proponents if the approach involved any contact with DBS customers by MVDDS or required additional information sharing by DBS. The approach adopted does not require such contact. Moreover, the Commission stated its belief in the *Second R&O* that any self-mitigation techniques that might be required should be modest and effective. Therefore, we believe that our approach is a reasonable compromise that respects the desire of DBS proponents to minimize customer contact with MVDDS parties. Nonetheless, we recognize that, as

¹⁰¹ EchoStar, DIRECTV joint petition at 4, and 19 at footnote 30; SBCA petition at 3 – 10.

¹⁰² *Second R&O* at ¶ 28.

¹⁰³ When making these determinations, our regulatory role may be characterized “in both prophetic and managerial terms: [we] must predict the effect and growth rate of technological newcomers in the spectrum, while striking a balance between protecting valuable existing [services] and making room for new advanced technologies.” (*Teledesic v FCC*, 275 F.3d 75, 84 (D.C. Cir. 2001). (“The Commission correctly conceives of its role in prophetic and managerial terms: it must predict the effect and growth rate of technological newcomers in the spectrum, while striking a balance between protecting valuable existing uses and making room for sweeping new advanced technologies.” Citing *Report and Order*, 15 FCCR at 13,431-33, pp1-2, 4-5.) In crafting these decisions, we are inevitably “making predictions within [our] area of special expertise at the frontiers of science.” *Baltimore Gas and Electric*, 462 U.S. 87, 103 (1983). See also *Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428, 443-445 (D.C. Cir. 1991) (upholding a FCC allocation decision - that was based upon the agency's belief that the allocation scheme would not result in harmful interference - because it was a “predictive judgment” of the type historically left to agency discretion).

¹⁰⁴ This was done, for example, in the case of DTV where we balanced new interference to existing TV service against new digital TV capabilities. See *Advanced Television Systems and Their Impact Upon The Existing Television Broadcast Service*, MM Docket No. 87-268, *Sixth Report and Order*, 12 FCC Rcd 14,588 (1997). Similarly, for the Location and Monitoring Service (LMS) in the 902-928 MHz band, we conditioned operation of certain stations upon the licensee's ability to demonstrate that their systems do not cause unacceptable levels of interference to 47 C.F.R. Part 15 devices. See 47 C.F.R. § 90.353(d). Also, we have allowed automated maritime telecommunication systems (AMTS) on frequencies near TV channels 10 and 13 and required the licensee to make such adjustments as may be necessary to fix any interference to household TV receivers. See 47 C.F.R. § 80.215(h).

SBCA asserts, Section 101.1440(e) of the adopted rules appears to require a DBS licensee to oversee all future DBS receive antenna installations, which they currently may not do. Often, DBS receive antenna installations are done through retail outlets that sell DBS equipment or by a DBS customer. It was not our intent to alter these arrangements. Rather, we expect a DBS licensee to provide to these entities information they deem necessary so that they may take into account the presence of MVDDS operations when they install a DBS receive antenna. Typically, this information could be conveyed with installation guidelines for DBS equipment. Thus, we will modify Section 101.1440(e) of the rules to clarify the responsibility of DBS licensees in this regard.

31. Petitioners also generally object on statutory grounds to our decision to impose any interference avoidance obligations on either DBS subscribers or providers. SES Americom, in particular, relies upon the *RLBSA* legislative history indicating that the FCC must, under Section 2002(b)(2), protect primary satellite system users, whether designated now or later, from harmful interference.¹⁰⁵ SES Americom concludes from the cited language that Congress could not have intended to protect future primary satellite *services* from terrestrial interference, but not later-deployed *receivers* of an existing primary satellite service.¹⁰⁶ In that light, SES Americom argues that the MVDDS/DBS rules the Commission adopted are inconsistent with clear legislative mandate because they violate the primary

¹⁰⁵ SES Americom petition at 13. Citing *RLBSA* legislative history, Cong. Rec. 106th Cong., 1st Sess. At S15014. The relevant language follows:

“Mr. Gorton: [I] would like briefly to address Section 2002 of the Intellectual Property and Communications Omnibus Reform Act of 1999, which is an amendment to the Omnibus package, to clarify its meaning with my colleague who drafted the provision.

There are a number of United States companies that have applied to the FCC for licenses to operate non-geostationary satellite systems in the so-called “Ku-band.” These firms are spending substantial amounts of private capital to develop satellite systems that will provide a host of telecommunications services to benefit the public. The satellite systems that have applied for licenses in the Ku-band are designed to operate globally on a primary basis, and already are treated as primary users of the Ku-band in the International Table of Frequency Allocations.

Mr. President, I bring this up because section 2002(a) directs the FCC to consider issuing licenses, possibly in the same bands, for new terrestrial communications services that provide local television to rural areas. Section 2002(b)(2) provides that the FCC must ensure that any new licensees for local television in rural areas do not cause harmful interference to primary users of the spectrum, presumably the Ku-band spectrum.

I want to clarify that Section 2002(b)(2) requires the FCC to prevent harmful interference not only with those who have been designated as primary users on the date of enactment of this Act, but also with prospective primary users of the Ku-band. If the FCC were to misinterpret this section, that is, if the FCC prevented only harmful interference with those who are primary users on the date of enactment, the public could be denied the substantial benefits of emerging satellite technologies.

Mr. McCain: I agree with my colleague that the authors of this bill did not mean to interfere with the expert technical and regulatory judgment of the FCC with respect to licensing applicants in the Ku-band. The term “primary user” in Section 2002 is intended to include primary users, regardless of whether these users are primary on the date of enactment or are later designated as primary. The provision in no way seeks to grant preferential regulatory treatment to terrestrial license applicants over satellite system applicants. While there appears to be an error in the report accompanying this legislation, which incorrectly states that the statute says that “existing” primary users must be protected, clearly the statute does not contain this qualifier, and it is our intent that the FCC protect primary users, whether designated now, or later.”

¹⁰⁶ SES Americom petition at 14.

status of DBS by requiring later-in DBS subscribers to take steps to avoid potential harmful interference from MVDDS.¹⁰⁷

32. We reject SES Americom's reliance upon and interpretation of the *RLBSA* legislative history to support their assertion that our treatment of new DBS subscribers violates the statute. As an initial matter, the statute requires us to ensure that harmful interference is not caused to DBS. As discussed above, we find that the technical rules adopted by the Commission comply with that directive. We find no additional directives in the plain language of the statute to indicate that Congress intended to preclude us from adopting appropriate licensing or sharing rules among the services that we might authorize in the band.

33. Furthermore, we believe that the legislative history of the *RLBSA* can be reasonably interpreted differently than suggested by SES Americom. Section 2002(b)(2) of the *RLBSA* reads as follows: "HARMFUL INTERFERENCE – The Commission shall ensure that no facility licensed or authorized under subsection (a) causes harmful interference to the primary users of that spectrum or to public safety spectrum use." [Emphasis in original]. At the outset, the term "primary user" appearing in the legislative history that is focused upon by petitioners is not defined in the statute. Upon close reading, we conclude that the language cited by petitioners regarding "prospective primary users" of the Ku-band concerns, what was at the time, the as-yet-undetermined status of future non-geostationary satellite (that is, NGSO FSS) service in the band. Specifically, when *SHVIA/RLBSA* was enacted, the Commission had not yet released the *First R&O* that first authorized NGSO FSS use of the 12.2-12.7 GHz band and accorded it co-primary status. Therefore, contrary to SES Americom's interpretation, it appears that the legislative history can more reasonably be read as indicating no more than the intent of Congress that NGSO FSS should be designated and protected as primary - as, in fact, the Commission subsequently decided in the *First R&O*. Indeed, as a further counterpoint to SES Americom's interpretation, we observe that the *RLBSA* legislative history also indicates that Section 2002(a) directs the FCC to consider issuing licenses for terrestrial services - possibly in the same bands.¹⁰⁸ Moreover, the legislative history also states that "the authors of this bill did not mean to interfere with the expert technical and regulatory judgment of the FCC with respect to licensing applicants in the [12 GHz] band."¹⁰⁹ Statutes must be interpreted to give effect to each of their provisions. In the *Second R&O*, the Commission reasonably concluded that MVDDS would not be viable with greater interference-sharing burdens than what were adopted, and that placing some of the burden on a primary service to assist in the sharing of spectrum with another co-primary service does not relegate either of those services to secondary status. Therefore, what the Commission has done is satisfy both of Congress's goals by crafting rules that both preserve the primary status of the satellite services in the 12.2-12.7 GHz band, and also enable another terrestrial service - MVDDS - to enter the band on a co-primary basis. In light of the foregoing, we find that petitioner's resort to the legislative history is of no avail since we conclude that we have complied with the explicit directive of the statute regarding harmful interference and that, even if considered, the legislative history does not support petitioners' assertions.

34. Petitioners also object that our interference avoidance obligations effectively render DBS secondary to MVDDS and violate certain Commission rules concerning harmful interference by terrestrial communication services. In essence, petitioners strive to apply rules and relocation policies that were clearly adopted for the specific case of dealing with point-to-point FS that were in operation prior to DBS. MVDDS as authorized in this proceeding was not envisioned when the rules cited by petitioners were adopted. As observed in the *Second R&O*, the Commission originally adopted the non-harmful interference provision of Section 101.147(p) to deal with the specific problem of transitioning the

¹⁰⁷ *Id.*

¹⁰⁸ *RLBSA Legis. history* (Senator Gorton) - S15014.

¹⁰⁹ *RLBSA Legis. history* (Senator McCain) - S15014.

relatively high power (up to 316,228 watts EIRP), two-way, point-to-point FS operations out of the 12 GHz band.¹¹⁰ At that time, our goal was to encourage the older point-to-point FS operations to vacate the band due to their incompatibility with DBS. To that end, the Commission imposed the transitional rules and constraints cited by petitioners on those older FS operations. In contrast, MVDDS is a low power (up to 0.025 watts - or 14 dBm - EIRP) one-way transmission specifically designed to share spectrum with BSS operations. This basic distinction was key to our initial threshold determination that MVDDS, unlike the older point-to-point FS, could share the 12 GHz band without causing harmful interference to DBS.¹¹¹ Consequently, we find that it would be inconsistent with the clear historical purpose of the rule to impose on MVDDS the transitional constraints of § 101.147(p) that were intended solely for the older point-to-point FS operations that we were encouraging to vacate the band.¹¹² With regard to footnote S5.490 of the U.S. Table of Allocations, we note that it states in pertinent part that "... in the 12.2-12.7 GHz band, existing and future terrestrial radiocommunication services shall not cause harmful interference to satellite services." In view of our determination that MVDDS will not cause harmful interference to DBS under the rules adopted in the *Second R&O*, we conclude that the Commission has not violated that provision.

35. As petitioners' assertions implicitly recognize, application of the traditional first-in-time principle in this novel situation involving sharing among three ubiquitous co-primary services could produce unintended or illogical results. For example, in various circumstances, one co-primary service could entirely preclude another from operation in entire geographic areas merely because either a transmitter or receiver was first deployed – even though the impact of the later-in service on the other co-primary service might be generally imperceptible in all but a few isolated instances. The Commission found it necessary in the *Second R&O* to craft new and unprecedented sharing rules that would achieve the desired result of allowing ubiquitous service for all co-primary services authorized in the band while preventing harmful interference as defined by our rules. To the extent that SES Americom asserts that our treatment of MVDDS is inconsistent with our treatment of NGSO FSS with regard to DBS protection we note the following. MVDDS is technically a vastly different service than either DBS or NGSO FSS. DBS programming emanates from satellites that produce coverage footprints on the land having signal strengths that are relatively constant over significant geographic areas within a particular radiation beam. In comparison, MVDDS programming will emanate from low-power, land-based transmitters whose signal intensity diminishes rapidly over relatively short distances from the transmitter site. As a consequence, the potential for interference to DBS from MVDDS tends to be highly localized to the immediate vicinity of the transmitter. NGSO FSS signals, on the other hand, can have a uniformly undesired impact to both DBS and MVDDS over extensive areas. Because the mechanism and extent of potential interference from each of these services is so different, the Commission found it necessary to determine the timing for the imposition of MVDDS self-mitigation duties on DBS subscribers based upon whether a DBS receiver predates an MVDDS transmitter. We readily acknowledge that this approach may be a departure from past practice where the Commission may have focused only on when a

¹¹⁰ As we explained in the memorandum opinion and order section of the *Second R&O*, "... in the early 1980's, the Commission adopted a non-harmful interference requirement on incumbent fixed point-to-point operations in the 12 GHz band and encouraged them to relocate to other spectrum because these operations were generally incompatible with the BSS allocation that was made. Specifically, the point-to-point operations were high powered (up to 316,228 watts EIRP), two-way links that could transmit in any direction. These characteristics require that such fixed links coordinate with other uses on a case-by-case basis, which is not possible with ubiquitous BSS operations. In comparison, in this proceeding we would permit fixed service operations that are low-power (up to 0.025 watts EIRP) one-way transmissions specifically designed to share spectrum with BSS operations." *Second R&O* at ¶ 28.

¹¹¹ *Id.*

¹¹² *See, also*, 47 C.F.R. § 101.1409, as adopted in the *Second R&O*, wherein we distinguish between the relative protection treatment of the older point-to-point licensees versus MVDDS licensees.

transmitter (in this case, a DBS satellite) begins operation. However, we reiterate the key point - as recognized by the petitioners - that this proceeding presents the unprecedented situation of ubiquitous, geographic sharing of three co-primary services. Therefore, we find that a traditional first-in-time approach focused solely on transmitters would be neither workable nor beneficial.

36. At the same time, we acknowledge that the DBS self mitigation steps envisioned by our sharing rules for DBS subscribers might not be effective in what we believe will be very infrequent circumstances within the limited extent of the predicted mitigation zone around each MVDDS transmitter. However, to put the magnitude and impact of this possibility in perspective, we note that both existing and prospective DBS customers already experience the inescapable reality that a variety of locations are presently, or may become, unsuitable for DBS reception due to signal blockage caused by factors such as tree growth or building construction and the like.¹¹³ For example, some individuals who live on a particular side of an apartment complex cannot receive DBS signals because they have no line of sight with any DBS satellite. In addition, the growth of a single tree in one's backyard might eventually render a formerly optimal DBS receiver installation unsuitable due to signal blockage. Nevertheless, in view of the increasing popularity of DBS notwithstanding these dynamically changing limitations, we find that DBS subscribers appear to accept as a norm of the DBS service that a variety of potential receiver sites might not be suitable for DBS reception or might require remedial measures. There is nothing in the record to suggest that this well-known fact of such occurrences with individual DBS customers has had any noticeable effect on the viability, marketability or status of DBS a primary service. Against this backdrop, and in view of the conservative EPFD limits imposed on MVDDS, we do not believe that the impact of MVDDS on DBS subscribers in any given area will rise above a *de minimis* level that is any more perceptible than the well-tolerated current status-quo. Consequently, we fundamentally disagree with SES Americom's assertion that future DBS providers will be significantly precluded from any geographic area. Moreover, we affirm our determination that the possibility that self-mitigation measures might be required by DBS subscribers is balanced by the public interest in providing a new service because we expect that the need for and impact of such measures on the DBS subscriber base will be negligibly small. Therefore, we find that the sharing rules adopted by the Commission preserve the primary status of DBS because DBS will not be precluded from deploying in any geographic area and will be essentially free of harmful interference.

37. In addition, we observe that, absent these carefully crafted sharing rules, it would be possible for a single later-in DBS subscriber who does not take simple interference avoidance measures to hold hostage or totally pre-empt MVDDS service to the public - even where potential interference could be readily avoided by the DBS subscriber. We do not believe that such a draconian outcome would serve the public interest when balanced against what we believe will be a negligible impact on DBS because it results in inefficient spectrum usage that prevents the initiation of a new service. Furthermore, as a matter of public policy, we have concluded that - as between a few DBS subscribers needing to take modest mitigation steps versus no alternative MVPD provider for hundreds or thousands - the public interest is better served by affording the choice of an alternative MVPD service. We find this to be particularly true in view of our judgment that relatively simple remedial measures taken by DBS customers should effectively resolve any anomalous MVDDS interference issues that might occur notwithstanding the very conservative regional EPFD limits imposed on MVDDS operation.

38. Finally, we disagree with SES Americom's assertion that the rules adopted by the Commission are inconsistent with the International Radio Regulations. The flaw in SES Americom's

¹¹³ Either tree growth or building construction, for example, that encroach within the DBS receiver'satellite line of sight would tend to have the similar effect of reducing (or possibly even totally blocking) the desired DBS signal and thereby increasing the chances of outages experienced by subscribers. Under these circumstances, DBS subscribers would likely use the same self-mitigation measures described herein, namely re-siting the antenna or possibly using a larger antenna to recover the diminished DBS signal.

argument is the recurring premise urged by petitioners, that we reject, that the rules and procedures adopted will cause harmful interference to both existing and future DBS subscribers. As we reaffirm herein, we believe that the rules and procedures adopted in the *Second R&O* will not result in harmful interference to DBS subscribers as defined by our rules. We believe that our rules will afford similar protection from harmful interference to any DBS customer when receiving signals from any satellite in orbital locations within the geostationary arc visible to the United States regardless of whether any such satellite is part of a domestic or foreign system. Accordingly, we find the argument that the Commission violated international rules and its own policies that prohibit harmful interference to DBS to be without merit.¹¹⁴

39. In conclusion, we find that petitioners cite nothing in *SHIVA*, *RLBSA*, or the *LOCAL TV Act* that constrains us from exercising our statutory authority under the Communications Act to craft appropriate rules for spectrum sharing between existing or future satellite services and new terrestrial services. In the *Second R&O*, the Commission found that any new sharing burdens imposed on incumbent DBS or NGSO FSS to accommodate MVDDS in the 12 GHz band are reasonable because they are modest, effective and outweighed by the potential benefit to the public of providing for a new potential competitor in the multichannel video and data markets.¹¹⁵ We thus affirm our earlier conclusion that the adopted sharing obligations will serve the public interest because we find that those requirements will result in more efficient spectrum utilization and will facilitate compliance with the non-harmful interference provisions of the statutes while allowing initiation of a new service.

b. Other Matters

40. EchoStar and DIRECTV assert that the substance of certain editorial changes and the manner in which they were made between the adoption and release of the *Second R&O* violate the *Administrative Procedure Act* and *Government in the Sunshine Act* (*Sunshine Act*).¹¹⁶ Petitioners argue that the majority of Commissioners agreed upon non-trivial editorial changes subsequent to the item's adoption without holding an open meeting.¹¹⁷ In that light, petitioners assert that the Commission's action violated the open meeting requirements of the *Sunshine Act*.¹¹⁸

41. We disagree. The *Sunshine Act* sets forth requirements for open meetings that, under 47 U.S.C. 155(d), are held each month by the Commission. A meeting subject to the *Act* is one where at least a quorum of Commissioners jointly conducts or disposes of agency business.¹¹⁹ Petitioners state, incorrectly, that the *Second R&O* was adopted at an open meeting on April 11, 2002.¹²⁰ In fact, however, the item was adopted by circulation - as provided for in 47 C.F.R. 0.5(d) of our rules.¹²¹ When we adopt

¹¹⁴ We note that we discussed the applicability ITU recommendations in the memorandum opinion and order portion of the *Second R&O*. *Second R&O* at ¶ 41.

¹¹⁵ *Second R&O* at ¶53.

¹¹⁶ EchoStar, DIRECTV joint petition at 23. Citing 5 U.S.C. Chapter 5, Section 552b.

¹¹⁷ EchoStar, DIRECTV joint petition at 23, citing Statement of Commissioner Kevin J. Martin - Dissenting in Part and Approving in Part, *Second R&O*.

¹¹⁸ *Id.*

¹¹⁹ 5 U.S.C. Chapter 5, Section 552b (a) (2). *See, also, FCC v. ITT World Communications, Inc.*, 466 U.S. 463, 470 (1984), quoting S. Rep. No. 94-354, at 2.

¹²⁰ EchoStar, DIRECTV joint petition at 23.

¹²¹ Section 0.5(d) states "Matters requiring *Commission* action, or warranting its consideration are dealt with by the *Commission* at regular monthly meetings, or at special meetings called to consider a particular matter. [. . .] In appropriate circumstances, Commission action may be taken between meetings "by circulation", which involves the submission of a document to each of the Commissioners for his approval."

an item by circulation, each Commissioner's vote is sequentially noted by an internal tracking system. Sequential, notational voting (circulation voting) by Commissioners is not prohibited by the *Sunshine Act* since the *Act* applies to any meetings that are held - but does not require that meetings be held.¹²² Furthermore, we note that separate consideration of agency business by individual Commissioners is explicitly excluded from the definition of a "meeting" by our rules.¹²³ Consequently, we find that no "meeting" that would be subject to the *Sunshine Act* was held. Therefore, the requirements of the *Sunshine Act* are not applicable. Accordingly, the EchoStar and DIRECTV joint petition is denied to the extent that it asserts that certain edits to the *Second R&O* violated the *Administrative Procedure Act* and the *Sunshine Act*.

42. Claiming that the adopted interference limits are too permissive, EchoStar and DIRECTV express concern that DBS providers might be required to increase effective power levels transmitted to DBS receivers in order to preserve the reliability of service their customers have come to expect.¹²⁴ They further argue that such an increase in power levels, if needed, would also require a reduction in the number of channels that can be provided by a DBS system.¹²⁵ Such a reduction in channel capacity, they contend, could have a real and substantial economic cost that would cause significant economic harm to DBS providers.¹²⁶ Given the substantial reliance interests of DBS providers on the terms under which their licenses were originally awarded, EchoStar and DIRECTV argue, DBS providers may well be able to show that this substantial cost constitutes a "regulatory taking" for which they would be entitled to compensation from the U.S. Treasury.¹²⁷

43. We find that petitioner's allegation is not ripe because it is contingent upon events that have not yet transpired and, in our predictive judgment, will most likely not be required because we have adopted conservative EPFD and EIRP limits on MVDDS that should ensure negligible impact on DBS subscribers. Therefore, we disagree with the fundamental premise that the adopted interference limits are insufficient or too permissive to protect DBS from harmful interference. Even petitioners themselves do not assert that the feared measures they describe will absolutely be necessary - they merely argue that DBS carriers "could be forced" to take the measures they describe.¹²⁸ Therefore, we conclude that EchoStar and DIRECTV's suggestion that a "regulatory taking" might be worked upon DBS providers at some future time is purely speculative and merits no further consideration.

2. DBS/MVDDS Sharing Rules

44. *Positions of the Parties.* Petitioners raise objections under the *Administrative Procedure Act* (*APA*) that the adopted technical rules are arbitrary, capricious, and contrary to law.¹²⁹ Broadly speaking, petitioners argue that the Commission, *inter alia*, failed to rationally explain our decisions, ignored the findings and recommendations of the *MITRE Report*, adopted rules that are contrary to other FCC rules and fail to protect DBS. Specifically, EchoStar and DIRECTV contend that the rules fail to guarantee

¹²² *Railroad Comm'n of Texas v. U.S.*, 765 f.2d 221 230 (D.C. Cir. 1985); *Communications Systems, Inc. v. FCC*, 595 F.2d 797 (D.C. Cir. 1978).

¹²³ 47 C.F.R. § 0.601(b).

¹²⁴ EchoStar, DIRECTV joint petition at 17.

¹²⁵ *Id.* at 17.

¹²⁶ *Id.* at 17.

¹²⁷ *Id.* at 17.

¹²⁸ *Id.* at 17.

¹²⁹ See, e.g., EchoStar, DIRECTV joint petition at 13.

that DBS carriers and their customers will be protected from harmful interference by MVDDS.¹³⁰ In addition, they are critical of several aspects of our predictive model, stating that the Commission failed to provide adequate notice under the *APA* for the predictive computer model relied on to develop EPFD limits.¹³¹ They further argue that the Commission failed to explain how the regional EPFD limits, which they claim are based on a flawed model, will prevent harmful interference to DBS service and thus protect DBS providers and customers.¹³² They assert that the record does not contain any assurance of the statistical accuracy of the model¹³³ and that the model has not been tested in the field.¹³⁴ They also assert that DBS subscribers located outside the predictive contour are not protected from harmful interference even if they are subject to higher power from MVDDS than the model predicts.¹³⁵

45. EchoStar and DIRECTV claim that our “double average” approach to developing the EPFD limits in which multiple satellite locations are averaged for each city and then multiple cities are averaged for each region fails to provide a meaningful limit on increased unavailability. Instead, they believe that the EPFD limits should be based on data for each of the specific sub-markets for which the Commission intends to license.¹³⁶ They argue that, even if the Commission concludes that an additional 10% unavailability of DBS due to MVDDS is permissible, using the 10% criterion as a starting point does not provide a meaningful standard.¹³⁷ Specifically, they state that: 1) the 10 percent standard is exceeded in 31 of the 32 markets examined with respect to one or more full-CONUS satellites; 2) the median increase in the 32 markets is more than 10 percent and the mean increase is almost 12 percent; 3) the predicted unavailability increases range as high as 20-30 percent in certain markets; and 4) the model fails to consider the “wing” satellites such as those located at 61.5 and 148° West Longitude.¹³⁸ To remedy these alleged failings, EchoStar and DIRECTV state that the model should be calibrated to yield EPFDs that meet a ceiling of 10% increased unavailability.¹³⁹

46. Finally, EchoStar and DIRECTV assert that the adopted safety valve, in which DBS licensees can petition to have the EPFD levels at specific locations adjusted due to anomalous situations, is deeply flawed.¹⁴⁰ They cite two reasons. First, they state that the existence of such a mechanism cannot save a rule making scheme that is otherwise arbitrary and capricious since the safety valve would expand to overshadow the rule itself. Second, they state that the safety valve is too vague and uncertain to provide any meaningful increase in protection for DBS providers and customers.

47. Northpoint, responding to petitions for reconsideration, agrees with the Commission’s conclusion that small theoretical changes in DBS unavailability that might result from MVDDS operation do not rise to the level of harmful interference.¹⁴¹ They further argue that even if one assumes that

¹³⁰ See, e.g., EchoStar, DIRECTV joint petition at 5.

¹³¹ *Id.* at 9 and 15, footnote 26.

¹³² *Id.* at 9.

¹³³ EchoStar, DIRECTV joint petition at 8.

¹³⁴ *Id.* at 15.

¹³⁵ *Id.* at 8.

¹³⁶ *Id.* at 8.

¹³⁷ *Id.* at 5. See also, note 47, *supra*.

¹³⁸ EchoStar, DIRECTV joint petition at 6-8.

¹³⁹ *Id.* at 7-8.

¹⁴⁰ *Id.* at 18.

¹⁴¹ Northpoint consolidated response to petitions for reconsideration at 21 (citing Second R&O at ¶ 32).

unavailability might increase by as much as 20-30%, it still does not represent harmful interference because such a small difference in availability cannot be practically detected because rainfall itself typically varies by similar amounts year-to-year.¹⁴²

48. Finally, Digital Broadband Applications Corporation (DBAC), in its comments on petitions for reconsideration, raises the concern that the Commission did not evaluate potential interference to U.S. terminals that might at some time in the future receive signals from satellites licensed by administrations other than the U.S. when establishing the EPFD levels for MVDDS.¹⁴³ DBAC argues that, as a result, domestic subscribers of non-U.S. satellites might not be afforded sufficient protection from MVDDS operations except, perhaps, near the U.S. borders.¹⁴⁴ DBAC indicates that it shares the concerns of EchoStar, DIRECTV, and SES Americom with respect to protection of satellite operations deployed after selection of an MVDDS site and asks us to amend the rules to protect such satellite operations.¹⁴⁵

49. *Decision.* Although petitioners clearly disagree with our decisions in the *Second R&O*, they provide no new substantive information that was not fully considered. Petitions for reconsideration are not granted for the purpose of altering our basic findings or debating matters that have been fully considered and substantively settled.¹⁴⁶ We find that petitioners' arguments do little more than disagree with our analysis, judgments, and policy choices. Bare disagreement, absent new facts and arguments, is insufficient grounds for granting reconsideration.¹⁴⁷ The resolution of the fundamental issues surrounding the protection of DBS raised by petitioners has been a central feature of this rule making from the outset. Full opportunity for all affected parties to comment has been afforded and we have fully considered all relevant matters in the record. In the absence of any new information, and in light of our review herein of the analysis, judgments and policy choices made by the Commission in the *Second R&O*, we find petitioners' arguments to be without merit.

50. As an initial matter, we address the assertions regarding the MITRE Report. We observe that petitioners' arguments are largely based upon apparent misunderstandings regarding the status and our consideration of the MITRE Report. The *LOCAL TV Act* merely required us to arrange for independent testing of the potential for MVDDS interference to DBS. The Commission complied with that requirement when the MITRE Corporation was contracted to conduct that testing. Additionally, the *LOCAL TV Act* does not specify that the findings and recommendations of the MITRE Report are to be conclusively binding upon our determination of what final rules would best produce the desired results. Had that been the case, the notice and comment rule making procedures followed by the Commission to develop the final rules would have been largely superfluous. Indeed, SES Americom essentially gets it right to the extent it acknowledges that it is ultimately within the Commission's discretion to resolve policy issues and that various conclusions of the MITRE report are characterized even by MITRE as

¹⁴² Northpoint consolidated response to petitions for reconsideration at 23.

¹⁴³ DBAC indicates that it has applied for authorization to provide U.S. consumers with interactive video service and high speed Internet access through a system that includes Canadian-licensed satellites in the 12.2-12.7 GHz band. See DBAC comments on petitions for reconsideration at 2.

¹⁴⁴ *Id.* at 3. 47 C.F.R. § 101.1423 requires that MVDDS transmitters within 35 miles of the Canadian and Mexican borders not cause harmful interference to stations in Canada or Mexico. See *Second R&O* at ¶ 195.

¹⁴⁵ *Id.* at 3-4.

¹⁴⁶ See, e.g., Regulatory Policy Regarding the Direct Broadcast Satellite Service, *Memorandum Opinion and Order*, 94 FCC 2d 741, 747-748 (¶¶ 10-12) (1983)(citing, e.g., *WWIZ, Inc.*, 37 F.C.C. 685, 686 (1964), *aff'd sub nom.*, *Lorain Journal Co. v. FCC*, 351 F.2d 824 (D.C. Cir. 1965), cert. denied, 383 U.S. 967 (1966); *Florida Gulfcoast Broadcasters, Inc.*, 37 F.C.C. 833 (1964); *Employment Practices of Stations--Charlotte, N.C. Market*, 77 F.C.C. 2d 1 (1980); *WEOK Broadcasting*, 4 Rad. Reg. 2d 503 (1965)).

¹⁴⁷ *Id.*

being merely a “recommendation.”¹⁴⁸ To inform our exercise of statutory discretion under the Communications Act, the Commission placed the MITRE Report on public notice on April 23, 2001, and asked for responsive comments that were exhaustively reviewed on the merits. Consequently, while recognizing that the MITRE Report is a centrally important document that provides critical technical insight and recommendations based upon a narrow set of testing conditions, we find that it was appropriate for the Commission to weigh its findings and recommendations in light of the totality of evidence in the record. Therefore, we find that neither the *LOCAL TV Act* nor the MITRE Report limits our broad statutory authority to exercise judgment in crafting rules that we believe will prevent harmful interference.

51. We note that our rules provide that any increase in DBS unavailability attributable to MVDDS would be in addition to the allowance apportioned to NGSO FSS. The petitioners have not persuaded us to differ from this conclusion. The Commission stated in the *Second R&O* that such a decision does not violate the ITU’s findings stated in ITU-R Rec. BO.1444,¹⁴⁹ as this recommendation only pertains to sharing between NGSO FSS and DBS. Moreover, the Commission noted that the increased unavailability attributable to MVDDS and NGSO FSS would not necessarily be independent events (because some outages due to each service would occur simultaneously) such that the apparent increases would not be directly cumulative (*i.e.*, the total DBS unavailability will actually be less than the sum of the individual increases in unavailability theoretically caused by the NGSO FSS systems and an MVDDS system).¹⁵⁰

52. We find as unfounded petitioners’ dispute with our methodology and their claim that adequate notice was not provided. Our predictive model embodies a well-reasoned and technically sound approach that was fully explained in light of all the facts in the record. The Commission proposed an analytic model and sought comment in the *Further Notice* on, among other matters, the validity of the model and asked commenters to suggest modifications or alternative models.¹⁵¹ Specifically, the Commission provided a methodology for converting the percentage of DBS unavailability into a carrier-to-interference (C/I) ratio¹⁵² and a proposed methodology for using that C/I ratio to compute the mitigation zone.¹⁵³ The model the Commission ultimately used to calculate the EPFD limits was based on the proposals, but modified somewhat based on our decisions in the proceeding (*e.g.*, our use of an EPFD limit rather than a C/I limit), comments of the parties, and the MITRE Report. Our ultimate decision as to the particular details of the predictive model is clearly a logical outgrowth of the *Further Notice* and

¹⁴⁸ SES Americom petition at 16, footnote 41.

¹⁴⁹ See Recommendation ITU-R BO.1444, “Protection of The BSS In The 12 GHz Band And Associated Feeder Links In The 17 GHz Band from Interference Caused by Non-GSO FSS Systems.”

¹⁵⁰ *Second R&O* at ¶ 79. We base this finding on our analysis, which (for computational simplicity) evaluated the effects of NGSO FSS and MVDDS independently. However, in some cases, the interference events caused by MVDDS and NGSO FSS signals will coincide.

¹⁵¹ *First R&O and Further Notice* at ¶¶ 266-276. See, in particular, ¶ 272 stating in part, “We propose to define an analytical model for calculating mitigation zones [...]. We request comment on the appropriateness of the model and parameters we have used in our analysis. Commenting parties proposing alternative calculation methods and parameters should provide sufficient technical analysis to support their proposals.” The models were made available on the Commission’s web site at <http://www.fcc.gov/oet/dockets/et98-206/>.

¹⁵² See *Further Notice* at Appendix H. Using this methodology, we conducted a study to determine the DBS outage statistics for top television markets. A summary of this analysis was included in the *Further Notice* as Appendix J. The full analysis was placed in the docket file of the proceeding. See Staff Analysis of DBS Outage Statistics for Top 32 Television Markets, February 13, 2001.

¹⁵³ *Id.* at Appendix I.

rationality based upon the comments filed and the facts of record.¹⁵⁴ Indeed, numerous proposals about specific inputs to be used in the predictive model were discussed throughout this proceeding.¹⁵⁵ Based on those comments, the Commission conducted its analysis as follows. The Commission selected 32 markets for analysis which represented climatic and geographic diversity across the U.S. It was our judgment, based on our analysis that this sample set, which was larger than the sample set analyzed by MITRE¹⁵⁶ or used by the DBS licensees in determining EPFD limits for NGSO FSS,¹⁵⁷ was sufficiently large and diverse to produce data representative of the entire country as a whole. This judgment was based on our finding the EPFD was most affected by a combination of satellite power and rain rate, both of which are fairly constant over large areas.¹⁵⁸ This observation led to our conclusion that EPFD limits can be developed for the entire U.S. based on a representative set of markets. Because of these dependencies (satellite power and rain rate), our analysis revealed that the U.S. could be divided into distinct regions in which the same EPFD limits would yield fairly constant levels of interference protection. After carefully considering the record¹⁵⁹ and in keeping with our policy objectives of providing clarity and as much certainty as possible to affected parties, the Commission determined that these goals would be satisfied by specifying regional EPFD levels rather than requiring the parties to calculate a separate EPFD for each market or even for each transmitter, as suggested by EchoStar and DIRECTV. Thus, we conclude that the averaging process necessary to determine regional EPFD levels applicable to all satellites and, by association, the use of a regional approach is reasonable and lawful and satisfies the Commission's policy objectives.¹⁶⁰ The model adopted is therefore similar to a model proposed in the NPRM. Commenters knew of the model and commented on it in both the comment and

¹⁵⁴ The model follows the methodology laid out in the relevant ITU recommendations, and our results are consistent with those of the parties. See para. 58, *infra*. See also, *Second R&O*, Appendix G for analysis results. Our model differs slightly with those of the parties. Footnote 173 of the *Second R&O* noted that Northpoint and DIRECTV used a spreadsheet for their computations. However, inputs to that spreadsheet come from the computational methods of ITU-R Recommendation P.618 (this is the same ITU-R Recommendation used by the Commission's model). See, e.g., DIRECTV Comments to the *Further Notice* at Appendix I, Table A, Lines 42 and 47. Under DIRECTV's approach, separate calculations are needed to determine the necessary inputs. The Commission's Mathcad model combines all the calculations into one self-contained module, which incorporates the same methodology as DIRECTV and Northpoint, but also incorporates the computations of the ITU Recommendation.

¹⁵⁵ *Id.* See also, e.g., *Second R&O* at ¶¶ 73-79.

¹⁵⁶ MITRE made policy recommendations after analyzing only ten locations across the U.S. See MITRE Report at 5-5

¹⁵⁷ Our 32 city sample was more than double the sample size used when the ITU analyzed the potential for NGSO FSS interference to DBS, which used an analysis of only 14 U.S. cities. See *Second R&O*, Appendix G, at footnote 679 citing Recommendation ITU-R BO.1444.

¹⁵⁸ Footnote 577 of the *Second R&O* stated that EchoStar submitted an application that shows an EIRP of 53 dBW for the entire eastern half of the United States. Similarly, this application generally shows an EIRP of 51 dBW for the rest of the continental United States. See Application for Minor Modifications of DBS Authorizations, Launch and Operation Authority, File No. DBS-88-01/68-SAT-ML-96/70, File No. DBS-88-02/6-SAT-ML-97/71, File No. DBS-74-SAT-P/L-96/72, Filed Dec. 30, 1997. Long term climatology data show the mean annual precipitation in inches does not fluctuate significantly over large areas throughout the United States. See climatology of the U.S. No. 81 - Supplement # 3, Maps of Annual 1961-1990 Normal Temperature, Precipitation and Degree Days at <http://lwf.ncdc.noaa.gov/oa/documentlibrary/clim81supp3/clim81.html>.

¹⁵⁹ The record generally contained two proposals for implementing the EPFD values. The first, advocated by EchoStar and DIRECTV, would have required a separate calculation of EPFD at each MVDDS transmitter. See, e.g., DIRECTV Comments to *Further Notice* at 20-21. The second, advocated by Northpoint, sought to implement four regional EPFD values. See Northpoint Comments to *Further Notice* Technical Appendix, at 5, 15-16.

¹⁶⁰ In addition, to verify that our EPFD levels did indeed provide comparable protection across our adopted regions, we analyzed an additional ten markets. The results of these sample computations showed outage increases consistent with our guidelines and the results from the original 32 city sample. See *Second R&O* Appendix G.

reply comment rounds. In addition, we note that our approach, which relied on averages, is no different than similar approaches taken by the Commission in other services. For example, separation distances to prevent interference between analog television stations are based on providing an acceptable level of service to a median TV receiver and this acceptable level of service is based on using propagation curves that estimate the median field strength present at 50% of the locations, 50% of the time. See 47 C.F.R. §§ 73.610, 73.684, and 73.699. *See also*, “Engineering Aspects of Television Allocations,” Report of the Television Allocations Study Organization (TASO) to The Federal Communications Commission, March 16, 1959. Petitioner's argument that the Commission violated notice requirements ignores these critical facts. For that reason, we reject their argument.

53. EchoStar and DIRECTV criticize our adopted EPFD rules by stating that the adopted 10% standard is exceeded in most markets examined with respect to at least one or more CONUS satellites, that the median and mean increases are greater than 10%, and predicted unavailability increases range as high as 20-30% with respect to certain satellite/city combinations. First, it is important to keep in mind that the increases in unavailability at question in this proceeding are very small. Given the reliability of DBS service today (typically 99.8-99.9% availability), a 10% increase in unavailability of 0.2% (99.8% availability) only increases the unavailability to 0.22% (99.78% availability). Similarly, in this case, even if unavailability were to increase 50% to 0.3%, DBS would still be available 99.7% of the time. In our judgment, increases sufficiently close to 10%, are therefore, fairly insignificant in the overall provision of DBS service and do not meet the definition of harmful interference as defined in our rules.¹⁶¹ Moreover, these parties err by referring to the 10% benchmark as a standard. The Commission has stated several times in this proceeding that the 10% criterion was used only as a starting point for developing the EPFD levels. As we discuss above in addressing legal and regulatory issues, it was our goal to come reasonably close to 10%, but it was not our goal - nor would it be reasonable given the complexity of the calculations and the variability of the factors involved - to determine an EPFD that yields exactly an increase of 10%. Because we used averages across satellites and regions to specify EPFD levels, it is not surprising that at least one satellite in each market examined exceeds the mean and median. In fact, by definition, half will exceed the median and half will be below. Again, given the relatively small increases in unavailability, we do not believe that DBS will suffer harmful interference. A further point worth noting is illustrated in Table 2 below in which column 2 shows the difference in unavailability percentage using our adopted EPFDs or a strict 10% limit. As can be seen from the table, these differences are very small - less than 5 hundredths of a percent for the cities shown.¹⁶² Thus, we conclude that the result of our averaging approach differs from the results that would be obtained by using a strict 10% limit by such a small amount as to be insignificant. This small difference is acceptable when balanced with the advantages of having a specified EPFD limit in the rules rather than a percentage criterion.

54. In addition, the petitioners' emphasis on the 20-30% unavailability range is somewhat misleading because it ignores the underlying significant factors. We observe that such increases only pertain to a single satellite, the one located at 110° West Longitude. As discussed in more detail below, this particular satellite has been replaced with a new satellite having better performance characteristics. However, to directly address petitioners' argument on its own terms, data based on the former satellite

¹⁶¹ *See* para. 23, *supra*.

¹⁶² A complete set of data for all cities we examined is contained in Appendix D. With limited exception, the difference between the percentage of DBS unavailability using our regional EPFDs and a strict 10% limit is less than 5.2 hundredths of a percent. The only exception to this is Seattle with respect to the “wing” satellites at 61.5° and 148° West Longitude, where the differences are 35.2 and 17.0 hundredths of a percent, respectively. We note that the baseline outages for Seattle with respect to these satellites are several times higher than for any other city/satellite combination. In this regard, we note that the MITRE Report suggested that it does not make sense to tailor the MVDDS interference criterion to protect DBS operations where reliable service is not now expected. *See* MITRE Report at 6-7 (suggesting that locations with more than 100 hours of baseline outage should not be protected). We effectively concur with the MITRE Report on this issue.

located at 110° West Longitude are presented below:¹⁶³ Tables 1 and 2 show results for cities predicted to experience some of the largest percentage increases in unavailability from this satellite (if it were still operational). For comparison purposes, Tables 3 and 4 show similar data for cities predicted to experience the least amount of increased unavailability.

Table 1: Satellite Located at 110° West Longitude – Cities with large increases in Unavailability (Outage). Comparison of Availability and Unavailability Attributable to MVDDS for Various Criteria.
(all values are expressed as a percentage over a year)

City	Baseline (rain only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)	
	Availability	Outage	Availability	Outage	Availability	Outage
Washington, DC	99.7360	0.2640	99.6644	0.3356	99.7096	0.2904
Pittsburgh	99.7955	0.2045	99.7393	0.2607	99.7751	0.2250
Philadelphia	99.7283	0.2717	99.6498	0.3502	99.7011	0.2989
New York	99.7483	0.2517	99.6783	0.3217	99.7231	0.2769
Boston	99.7801	0.2199	99.7136	0.2864	99.7581	0.2419
Nashville	99.7140	0.2860	99.6482	0.3518	99.6854	0.3146

Table 2: Satellite Located at 110° West Longitude - Cities with large increases in Unavailability. Comparison of Changes in Availability and Unavailability Attributable to MVDDS for Various Criteria

City	Column 1	Column 2	Column 3
	Increase in Outage (using regional EPFD)	Rain plus MVDDS	Increase in Outage over Baseline (Using regional EPFD)
	Difference Between Rain plus MVDDS and Baseline (rain only)	Difference Between Regional EPFD and assumed 10% limit	(%)
Washington, DC	0.0716	0.0452	27.1
Pittsburgh	0.0562	0.0357	27.4
Philadelphia	0.0785	0.0513	28.9
New York	0.0700	0.0448	27.8
Boston	0.0665	0.0445	30.2
Nashville	0.0658	0.0372	23.0

Note: The absolute value of the difference is the same whether comparing availability or outage (unavailability).

¹⁶³ Data is taken from *Second R&O*, Appendix G.

Table 3: Satellite Located at 101° West Longitude – Cities with small increases in Unavailability (Outage). Comparison of Availability and Unavailability Attributable to MVDDS for Various Criteria.

(all values are expressed as a percentage over a year)

City	Baseline (rain only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)	
	Availability	Outage	Availability	Outage	Availability	Outage
Greenville	99.926	0.074	99.922	0.078	99.919	0.081
Charlotte	99.945	0.055	99.955	0.045	99.954	0.046
Washington, DC	99.958	0.042	99.956	0.044	99.954	0.046
Indianapolis	99.911	0.089	99.909	0.091	99.902	0.098
Pittsburgh	99.968	0.032	99.966	0.034	99.965	0.035
Columbus	99.961	0.039	99.960	0.040	99.957	0.043

Table 4: Satellite Located at 101° West Longitude - Cities with large increases in Unavailability. Comparison of Changes in Availability and Unavailability Attributable to MVDDS for Various Criteria

City	Column 1	Column 2	Column 3
	Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference Between Regional EPFD and assumed 10% limit	Increase in Outage over Baseline (Using regional EPFD) (%)
Greenville	0.004	(0.003)	5.444
Charlotte	0.003	(0.002)	5.544
Washington, DC	0.002	(0.002)	5.762
Indianapolis	0.002	(0.007)	2.249
Pittsburgh	0.002	(0.001)	5.865
Columbus	0.001	(0.002)	3.791

Notes: The absolute value of the difference is the same whether comparing availability or outage (unavailability).

Values shown in brackets indicate performance exceeding an assumed 10% limit.

55. As shown in Table 2, the increase in unavailability (or decrease in availability) of DBS service over the baseline unavailability for cities with the largest percentage increase in unavailability is less than one-tenth of one percent in all cases for the satellite located at 110° West Longitude. For the satellite located at 101° West Longitude, Table 4 shows even better results for cities with the least percentage increase in unavailability – less than one-hundredth of one percent. Thus, for all cities, the increase in unavailability is very small.¹⁶⁴ To illustrate even further that, in many cases, seemingly large values for the increase in DBS unavailability result in insignificant outage in absolute terms, it is instructive to look at a city where the baseline outage is very small. In Denver, the increase in outage over the baseline due to MVDDS is 14%, but the actual increase in minutes is predicted to be a mere 22.5 minutes over an entire year.¹⁶⁵ These outage increases due to MVDDS are significantly less than the

¹⁶⁴ See Appendix D for results from all satellites and all cities.

¹⁶⁵ See Appendix D for complete data. In Denver, the baseline unavailability for a year is 0.0296%. The unavailability rises to 0.0339% per year with MVDDS operating under our regional EPFD limits. This represents an increase in unavailability of 14%, but the absolute increase in outage percentage is only 0.0043 (i.e., 0.0339 –

(continued....)

seasonal and yearly variability in actual rain fall rates, and therefore, the variability in outage already experienced by many DBS customers.¹⁶⁶ In any event, we also note that consumers will never see outages of the magnitude shown. As alluded to above, in August, 2002, EchoStar launched a new satellite into the orbital slot at 110° West Longitude and began operation in October, 2002.¹⁶⁷ This satellite uses a CONUS beam for national coverage and spot beams, which concentrate more power into specific geographic areas,¹⁶⁸ to provide local TV channels. We observe that the CONUS beam of the new satellite provides approximately 3 dB more power than the old satellite. Because we have specified a hard EPFD limit, DBS operators (and consumers) get the performance benefits of these new satellites whether they receive their signal from the CONUS beam only or a combination of the CONUS beam and a spot beam. This is clearly illustrated in the *Second R&O*, where the Commission showed how the new spot beam satellite at 119° West Longitude would decrease unavailability.¹⁶⁹ Similar results are seen for

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$0.0296 = 0.0043$). The corresponding increased unavailability per year in terms of minutes is calculated by multiplying the increase in unavailability percentage by the number of minutes in a year: $0.0043/100 * 8766$ hours/year * 60 minutes/hour = 22.6 minutes/year. Note: the increase in unavailability percentage is divided by 100 because it is expressed as a percentage. Also the result of 22.6 minutes/year differs from the previously stated 22.5 minutes/year. This difference can be attributed to rounding as various calculations have been made.

¹⁶⁶ Footnote 179 of the *Second R&O* noted that there are seasonal and yearly variations in the amount of rain in any given area. For example, we showed the variation in amount of rain for January and August for Reno, NV and Allentown, PA over a twelve year period. (Source: National Climatic Data Center <http://lwf.ncdc.noaa.gov/oa/climate/research/cag3/city.html>).

	Rain (inches/month)			
	Reno, NV		Allentown, PA	
Year	January	August	January	August
2001	0.18	0.00	2.37	2.50
2000	2.14	0.79	1.99	5.22
1999	0.76	0.82	5.44	3.81
1998	1.10	0.00	3.42	3.12
1997	3.32	0.00	3.38	5.12
1996	1.33	0.16	7.32	0.91
1995	3.31	0.00	3.49	0.76
1994	0.06	0.00	5.69	6.18
1993	2.42	0.00	1.98	5.39
1992	0.13	0.28	1.73	4.08
1991	0.01	0.24	2.77	2.54
1990	0.62	0.21	4.57	6.47

¹⁶⁷ EchoStar VIII was launched on August 21, 2002 and began operation in October 2002. See <http://www.dishnetwork.com/content/aboutus/satellites/echo8/index.shtml> and <http://biz.yahoo.com/e/021114/dish10-q.html> for more details. For technical details of the new satellite see also *Application of EchoStar Satellite Corporation for Authority to Launch and Operate EchoStar VIII*, File No. SAT-LOA-20020329-00042; *Application of EchoStar Satellite Corporation for Minor Modification of DBS Authorization, Launch and Operating Authority EchoStar VIII*, SAT-MOD-20020329-00041; and the *Revised Technical Appendix*, SAT-AMD-20020430-00086.

¹⁶⁸ Older DBS satellites tried to cover the whole of the U.S. with one continental antenna beam. Newer satellites use multiple antennas or beams which focus the signal onto smaller locations or spots, and have the effect of increasing the signal level in those areas. See, also, footnote 164, *supra*.

¹⁶⁹ Footnote 211 of the *Second R&O* provided an example. We calculated a baseline outage of 1331.7 minutes per year in Atlanta when viewing the satellite at 119° west longitude. On February 21, 2002, EchoStar launched a new satellite, EchoStar 7, to this orbital location. This satellite is more powerful than the previous satellite at 119° west

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the new satellite at 110° West Longitude.¹⁷⁰ As a final point, EchoStar disputes our contention that newer satellites and technology will improve the DBS situation, claiming that their new satellite employs the same output tube as its previous satellite (*i.e.*, the one used for our analysis).¹⁷¹ Clearly, as shown from our examples, even with the same output tube, the power from the new satellites is now being concentrated into a stronger CONUS beam and spot beams, which has the practical effect of providing more power to consumers' receive antennas, thereby making it less susceptible to interference from another source such as MVDDS.

56. It is also important to recognize that the unavailability increases calculated from our adopted EPFDs are worst case. In most instances, consumers will experience increases below these levels. The Commission used very conservative assumptions when determining the EPFD levels. Among these, the Commission assumed free space path loss over a flat earth; natural shielding by terrain, foliage, and buildings was not considered. the Commission also assumed a rain faded DBS signal, but a full strength MVDDS signal. Because they will use the same frequencies, rain affects both DBS and MVDDS in a similar fashion causing faded signals. Rain tends to be localized events and in many cases the same rain that fades the DBS signal would also fade the MVDDS signal. Further, the Commission assumed a quasi-error free (QEF) DBS threshold receiver value.¹⁷² At the threshold for QEF performance, interference from MVDDS would be essentially imperceptible to a DBS customer. In fact, customers would not be able to perceive any degradation to their picture until the DBS signal dropped to a level below this threshold.¹⁷³ We also observe that consumers will not necessarily be impacted by the full

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longitude and will also use spot beams to many markets. In Atlanta, this translates to a reduction in baseline outage to 645.9 minutes per year for the general DBS signal and to 156.5 minutes per year for those channels that are transmitted using the spot beam. See Application of EchoStar Satellite Corporation for Minor Modification of DBS Authorization, Launch and Operating Authority for EchoStar 7, File Nos. SAT-MOD-20010810-00071 & SAT-A/O-20010810-00073, (August 10, 2001). As shown in the table below, a corresponding decrease in the outages caused by MVDDS would also be seen:

Atlanta, GA								
Satellite	Baseline Outage	Baseline Outage plus 10% Increase	EPFD For 10% Increase	FCC Adopted EPFD	Outage With FCC EPFD	Outage Increase		Difference Between Calculated And FCC EPFDs
	(minutes)	(minutes)	(dBW/m ² /4 kHz)		(minutes)	%	(minutes)	dB
Previous	1331.7	1464.87	-169.4	-168.4	1510	13.4	178.3	0.96
Echo7 (General)	645.9	710.49	-166.5	-168.4	686.4	6.3	40.5	-1.9
Echo 7 (Spot)	156.5	172.15	-160.3	-168.4	158.7	1.4	2.2	-8.1

¹⁷⁰ See Appendix D, Table 6 for data showing the decrease in outage using the new spot beam satellite compared to the previous satellite.

¹⁷¹ EchoStar, DIRECTV joint petition at Verified Statement of Edmund F. Petruzzelli, p. 5.

¹⁷² Quasi-error free (QEF) performance equates to 1 uncorrectable error per hour. The QEF value represents an audio/video signal that appears essentially error-free to the DBS customer; almost all errors that occur in transmission can be corrected using forward error correction at the DBS customer's decoder.

¹⁷³ Other performance levels also exist. For example, if a DBS signal drops below the operating threshold, the subscriber may experience a pixilated picture (*i.e.*, portions of the picture may be represented as a blank square). There is also a freeze-frame threshold below which viewing becomes difficult. When the bit error rate of the demodulated MPEG video bit stream is sufficiently high to cause the associated video MPEG decoder to cease to

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amount of any increase in unavailability as outages do not always occur at the precise moment when television is being watched – sometimes they occur when people are sleeping or away from home, or at times when they are not watching. In consideration of these factors, along with the use of newer satellites (as described above), we are confident that DBS consumers will not experience outages to the extent that our worst case modeling calculated.

57. Regarding the “wing” satellites – those with partial CONUS coverage located at 61.5° and 148° West Longitude - EchoStar and DIRECTV assert that the Commission did not include these satellites in the development of EFPDs. They are correct. However, neither EchoStar nor DIRECTV provide any data or calculations showing how using these “wing” satellites would have changed the EFPD limits. The Commission reasoned that because the footprint of the full CONUS satellites encompass the footprint of the partial CONUS satellites, and the operating characteristics (*i.e.*, power) are similar, the Commission believed that it could simplify the calculations by developing the EFPD limits using only the CONUS satellites. The Commission believed that the EFPDs calculated based on the CONUS slots would result in comparable increases in unavailability to DBS subscribers who receive programming from the other slots. To ensure the validity of this approach, sample calculations were performed on the satellites at 61.5° and 148° west longitudes to determine the increases in unavailability that would result from our EFPD limits. These calculations, which were contained in the *Second R&O*, confirmed that impact of the adopted EFPD limits is acceptable in locations where reliable DBS service could be expected.¹⁷⁴ Our goal throughout this proceeding has been to allow the introduction of a new service while still protecting DBS. If our calculations had produced results inconsistent with those of the CONUS satellites, the Commission would have reconsidered our approach towards these satellites. To do otherwise would have been irresponsible and not in keeping with our goal of protecting DBS service. As a corollary, the same reasoning holds with respect to the concerns of DBAC who is proposing to use Canadian-licensed satellites located at 82° and 91° West Longitude to provide two-way digital data and video services to U.S. consumers.¹⁷⁵ We observe that these satellites are located between the U.S. licensed satellites located at 61.5° and 101° West Longitude. To serve the U.S., the footprint of DBAC’s proposed satellites must be encompassed by the existing U.S. satellites. Thus, assuming that these

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provide one or more pictures, the video decoder initiates error concealment techniques, such as the presentation of the last available MPEG picture (freeze frame). By using the QEF threshold (*i.e.*, the highest threshold value) in the predictive model, the Commission evaluated the worst case impact on DBS signal quality. Finally, we note that the DBS licensees used the less stringent operating threshold in developing the EFPD levels associated with NGSO FSS operation. In that case EchoStar and DIRECTV assumed an operating threshold of 6.1 dB and 5 dB, respectively. See ITU-R Recommendation BO.1444, Annex 1. The database of representative links is available on the ITU’s website at <http://www.itu.int/itudoc/itu-r/sg11/docs/sg11/1998-00/contrib/138e2.html>. The QEF thresholds as specified by MITRE are 8.1 dB and 8.4 dB for EchoStar and DIRECTV, respectively. See MITRE Report at 3-18. Thus our use of QEF is 2 dB more conservative than EchoStar and 3.4 dB more conservative than DIRECTV with respect to the values they supplied for the NGSO FSS analysis.

¹⁷⁴ See *Second R&O*, Appendix G. Additionally, we note that MITRE suggested that it does not make sense to tailor the MVDDS interference criterion to protect DBS operations where reliable service is not now expected. See MITRE Report at 6-7 (suggesting that locations with more than 100 hours of baseline outage should not be protected). In this regard, the two sample calculations for Seattle from both the satellite at 61.5° and at 148° had baseline outages in excess of 100 hours indicating that calculations should take into account the use of larger DBS receive antennas. Excluding the values for Seattle, the data for the satellites at 61.5° and 148° show “outage increases” from 4.4% to 28.5% with a median value of 7.3% and a mean of 10.8%. These values compare favorably with the values for the CONUS satellites in our 32-city sample.

¹⁷⁵ Unlike the pending petition from SES Americom, DBAC proposes to use satellites that are part of the Region 2 BSS plan. We also note that DBAC did not file a petition for reconsideration in this proceeding. However, for completeness we address their specific concern herein.

satellites are similar to the U.S. licensed satellites (DBAC provides no technical information regarding there proposed satellites), DBAC should be adequately protected.

58. With respect to EchoStar and DIRECTV's assertion that the rules are deficient because the record does not contain any assurance as to the accuracy of the predictive model, we find that argument to be without merit. Our model used similar methodology as that used by MITRE and DIRECTV in their analyses. While the calculations of DBS outage are complex, they generally follow methodology developed and recognized internationally by the ITU. For example, the Commission developed an excel spreadsheet implementing ITU-R Recommendation P.837 to calculate rainfall rates that are an essential input to model.¹⁷⁶ Similarly, our model incorporated procedures from ITU-R Recommendation P.618-6,¹⁷⁷ ITU-R Recommendation P.838-1,¹⁷⁸ ITU-R Recommendation P.841-1,¹⁷⁹ and ITU-R Recommendation P.839.¹⁸⁰ These Recommendations have not been disputed throughout this proceeding.¹⁸¹ To ensure that the inputs to the model were accurate, the Commission used data gathered from MITRE, the DBS licensees' applications, and from the information on file with the ITU used for the sharing studies of DBS and NGSO FSS. This data has been on the record and has never been disputed. Therefore, based on the use of these data and the use of accepted modeling techniques, we believe that our model is as accurate as possible given the inherent variability of rain rates from year to year.

59. Moreover, we find that insistence on - or the absence of - the certainty sought by petitioners does not support reconsideration. The analysis and discussion in the *Second R&O* clearly demonstrate that the Commission has given serious consideration to a wide array of complex technical factors in formulating the predictive model and related rules in a manner that we believe will be effective. Based upon this careful consideration, the Commission concluded that the predictive model along with the resulting rules and procedures that were adopted should protect DBS from harmful interference and should otherwise be workable and beneficial in practice as predicted. At the same time, we also note that determinations of this nature may be, as the courts have observed in other instances, "at once a highly technical and somewhat speculative undertaking" and that such determinations "are precisely the sort that Congress intended to leave to the broad discretion of the Commission."¹⁸² Therefore, we find that the

¹⁷⁶ See ITU-R Recommendation P.837, "Characteristics of precipitation for propagation modeling." We provided the Excel spreadsheet that calculates the rain rate exceeded 0.01% of an average year to the public through our web site. See <http://www.fcc.gov/oet/dockets/et98-206/>.

¹⁷⁷ See ITU-R Recommendation P.618, "Propagation Data and Prediction Methods Required for the Design of Earth-Space Telecommunication Systems."

¹⁷⁸ See ITU-R Recommendation P.838-1, "Specific attenuation model for rain for use in prediction methods."

¹⁷⁹ See ITU-R Recommendation P.841-1, "Conversion of annual statistics to worst-months statistics."

¹⁸⁰ See ITU-R Recommendation P.839, "Rain height model for prediction methods."

¹⁸¹ We note however, that DIRECTV, in making its original comments used an earlier version of ITU Recommendation P.618. They assumed version 5. Northpoint, in making their calculations used version 6. After careful consideration, we decided to use version 6 in our mode after determining that it provided better accuracy than version 5. See *Second R&O* at ¶ 81.

¹⁸² *C.f. National Association of Regulatory Utility Commissioners v. FCC*, 525, F.2d 630, 636 (1976) ("The orders under review reveal that the Commission has given serious consideration to the arguments raised as to the extent of the allocation. They reveal also that the determination of how much bandwidth to allocate to cellular systems is at once a highly technical and somewhat speculative undertaking. The amount of spectrum that is appropriate depends upon an estimate of the nature and capabilities of technology that is now only partially developed, and upon projected demands [...] "[...] We conclude that such determinations are precisely the sort that Congress intended to leave to the broad discretion of the Commission by imposing a broad public convenience, interest or necessity standard.")

determinations made by the Commission in the *Second R&O* are appropriately dependent upon the exercise of our judgment under the broad statutory authority of the Communications Act.¹⁸³

60. In regard to field testing, we point out that it has never been a requirement under our rules that field testing be carried out prior to allowing a new service to begin operation. All that is required is that the Commission consider the facts on the record and create rules to protect primary users of the spectrum from harmful interference. We believe that our extensive modeling of the interactions between MVDDS and DBS demonstrate that this is the case here, as has been done for the implementation of many new services that the Commission has authorized over the years. Thus, we do not believe that field testing is necessary. We do note however that some field testing has been done, although not by the Commission. MITRE conducted a simulation of the interaction between DBS and MVDDS and determined that sharing between these services was feasible. In addition, Northpoint, MDS America, DIRECTV and EchoStar have field tested MVDDS systems under experimental authorizations.¹⁸⁴ In general, these tests support our analysis and show that MVDDS and DBS can coexist.

61. As mentioned earlier, a zone exists around each transmitter where it is possible that the EPFD, absent any mitigation, may exceed the adopted limit. Our model calculates the contour that defines this zone. EchoStar and DIRECTV aver that DBS subscribers located outside the predictive contour are not protected from harmful interference even if they are subject to higher power from MVDDS than the model predicts. We disagree with this assertion as it is contrary to a straightforward reading of our rules. Our rules have been designed to ensure that all DBS subscribers, no matter where they are located, are protected from harmful interference caused by MVDDS. Our model provides the parties with essential information regarding the area where the EPFD could be exceeded based on power levels, antenna pattern, and antenna height. We understand that other interactions, such as reflections or multipath, could occur which, although unlikely,¹⁸⁵ could cause a DBS subscriber located outside the predicted contour to receive an EPFD above the adopted level. We contemplated this possibility and crafted the rules with this in mind. Thus, Section 101.1440(g) of our rules states that, “[t]he MVDDS licensee must satisfy all complaints of interference to DBS customers of record which are received during a one year period after commencement of operation of the transmitting facility. Specifically, the MVDDS licensee must correct interference caused to a DBS customer of record or cease operation if it is demonstrated that the DBS customer is receiving harmful interference from the MVDDS system or that the MVDDS signal exceeds the permitted EPFD level at the DBS customer location. MVDDS must satisfy all complaints of interference.”¹⁸⁶ Nowhere does this rule stipulate that MVDDS must only satisfy

¹⁸³ As the courts have found, “To insist upon concrete proof that a proposed innovation will succeed without undesirable side effects would be effectively to relegate the Commission to preserving the status quo. *All that is required is that the Commission set forth generally the bases for its informed prediction that the plan should be workable and beneficial.*” [Emphasis added]. See *Telocator Network of America*, 691 F.2d 525 (D.C. Cir. 1982).

¹⁸⁴ See, e.g., Northpoint’s December 1998, Progress Report WA2XMY; Northpoint’s October 1999 Progress Report WA2XMY. See also, MDS America Experimental License Callsign WC2XPU. See also, MDSA Clewiston Phase I Test Report, (Oct. 16, 2001). On February 9, 2000, the Commission granted DIRECTV and EchoStar experimental authorizations in Washington, D.C. and Denver, CO to test DBS sensitivity to fixed service transmissions, such as those proposed by Northpoint. On July 25, 2000, DIRECTV and EchoStar filed a “Report of the Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon Hill, MD, May 22 to June 7, 2000” for the Commission’s consideration.

¹⁸⁵ Each time a RF wave reflects it loses some energy. To protect DBS, our rules limit MVDDS to a fairly weak signal (14 dBm EIRP). By the time the signal propagates past a DBS receive antenna located outside of the predicted contour, reflects off a surface, and propagates back to that DBS receive antenna, the signal, which we have already predicted to be below the adopted EPFD level, will be at such a low level that there should be no effect on DBS service.

¹⁸⁶ See 47 C.F.R. § 101.1440.

complaints of interference from DBS customers located within the predicted contour. Thus, we believe the complaint of EchoStar and DIRECTV to have no merit.

62. Even after carefully crafting rules that protect DBS, the Commission added a provision to provide a remedy in the event that an anomalous situation arises for which our model may not correlate with the experience of DBS customers. This “safety valve” rule is criticized by EchoStar and DIRECTV. Again, we disagree with the petitioners. First, we have clearly shown that our decisions in this proceeding have been reasoned, based on the record, and neither arbitrary nor capricious. In practice, we do not believe that parties will have to resort to the safety valve; and we find that its use in a few limited situations will certainly not overshadow the adopted rules. Second, the petitioners other argument centers around an assertion that the rule is vague and that the Commission does not lay out exactly what they may need to specify in the event that they wish to use the safety valve. We are not sympathetic to this argument. In many cases, the Commission provides opportunities for licensees to petition for adjustments to rules (outside the waiver process) without specifying in exacting detail how such a filing should be made.¹⁸⁷ We cannot anticipate every circumstance and, consequently, prefer that the affected parties have sufficient flexibility to demonstrate the requirements as they see best. However, to provide some guidance, our intent is that the safety valve be used for situations that are outside of the norm (*i.e.*, anomalous). For example, if there is an area within one of our defined regions where the rain rate is inconsistent with the rest of the region, a DBS licensee can provide proof of this situation and a showing that their customers could be adversely affected. In such a case, the Commission would consider the facts and, if deemed appropriate, adjust the EPFD for this specific location to account for the uncharacteristic situation. We believe that the safety valve rule as written is a useful tool to ensure that MVDDS operations fully protect DBS.

63. After review of our technical findings from the Second R&O, we find that the adopted rules were borne out of reasoned decision making - they are both reasonable and lawful - and that the Commission provided rational explanations for each of our decisions after consideration of all the facts of record. The Commission adopted these rules fully aware that there would be some minor impact on DBS service, but found that such a result was outweighed by the potential addition of a competitor to the MVPD market. In crafting the rules for this new service, the Commission was careful to insure that any such impact to DBS, both existing and future, were minimized to ensure a lack of harmful interference (in light of the conservative values used, the interference avoidance measures that the DBS customer can employ with a minimum of difficulty, and the added protections that the safety valve provides). We conclude that petitioners’ wide range of allegations that the adopted rules and procedures are arbitrary and capricious and violate the *APA* are without merit in all respects and must be denied.

3. Implementation Issues

64. *Petitions overview.* EchoStar and DIRECTV argue that the MVDDS entry procedures are arbitrary, capricious and unsupported by the record and are not adequate to protect DBS customers from harmful interference.¹⁸⁸ In particular, EchoStar, DIRECTV and SBCA assert that the rules do not ensure that the MVDDS entity will conduct an accurate or complete site survey. EchoStar and DIRECTV claim that the lack of clear direction may cause the MVDDS provider simply to sample a number of sites or to

¹⁸⁷ For example, private land mobile licensees operating in the 450-470 MHz band are limited to specific ERP/antenna height combinations and service areas with radii no greater than 32 kilometers. However, the rules also provide: (1) that “[a]pplications ... where special circumstances exist that make it necessary to deviate from the ERP and antenna heights ... will be ... accompanied by a technical analysis base upon generally accepted engineering practices and standards, that demonstrates that the ... parameters will not produce a signal strength in excess of 39 dBu ...”; and (2) “[a]n applicant for a ...service area radius greater than 32 km (20 mi) must justify the requested service area radius, ...”. See 47 C.F.R. §§ 90.205(g)(2) and 90.205(g)(3).

¹⁸⁸ See EchoStar, DIRECTV joint petition at 5.

go door-to-door seeking information, and that 45 days is not sufficient time for DBS entities to notify an MVDDS provider whether the EPFD contours have been correctly calculated and whether the EPFD limits are exceeded at any DBS customer location.¹⁸⁹ EchoStar and DIRECTV also object to the requirement that the DBS provider provide a list of new DBS installations to the MVDDS provider since this information is proprietary and competitively sensitive, thus subject to misuse by an MVDDS operator. SBCA suggests that the DBS provider may only have billing information for a customer but not know the receiver location. SBCA asserts that the rules do not require the MVDDS licensee to check EPFD levels at locations that were not included on the initial survey, but later identified by the DBS licensee.¹⁹⁰ SBCA also is concerned that the EPFD measurements will not be accurate if taken at the property line, not at the actual installation site, and EchoStar and DIRECTV argue that the Commission has not identified a standard for field measurement of EPFD levels. EchoStar and DIRECTV also assert that allowing the MVDDS provider attempt to get DBS customers to waive EPFD limits at a particular site could lead to mischief (*e.g.*, misrepresentation to the customer of its interference rights).¹⁹¹

65. EchoStar and DIRECTV also request that we clarify the dispute resolution process. They claim that the rules suggest that disputes will be resolved within the remaining 45 days after the DBS companies respond to the coordination notification, but the rules are silent on how disputes should be resolved and what happens if disputes are not resolved within this period (*e.g.*, can the MVDDS transmitter begin operations).¹⁹²

66. MDS America asks us to reconsider the MVDDS entry procedures to eliminate the site survey, which they argue is cumbersome and expensive, and the requirement that DBS entities identify new customers for the MVDDS provider. They urge instead that we simplify the coordination requirements by requiring DBS providers to identify, within 45 days of the receipt of the notice required by section 101.1440(d) of the rules, only those locations of a DBS customer of record which they believe would receive harmful interference from the proposed MVDDS transmitter.¹⁹³ Northpoint disagrees with MDS America's request and argues that it can properly site its transmitters without having access to DBS customer information.¹⁹⁴

67. *Decision.* We find petitioners' argument that the Commission failed to provide sufficient detail or specificity about MVDDS entry procedures to be without merit. In our view, petitioners have strained to take the relatively straightforward rules and procedures that were adopted and construe them in a vacuum devoid of any assumption of reasonableness or good faith by the parties involved. Moreover, as a practical matter, we believe that the excessive level of regulatory oversight sought by petitioners, if adopted, would result in sharing rules and entry procedures that are so burdensome, inflexible and complex that the entire implementation plan would not serve the public interest. In contrast, we note the Commission has previously taken a more flexible approach in other proceedings that involved far more complex interactions among competing licensees. For example, in the *Emerging Technologies* proceeding,¹⁹⁵ and the subsequent *18 GHz Relocation* and *2 GHz Relocation* proceedings, we declined to

¹⁸⁹ See EchoStar, DIRECTV joint petition at 19.

¹⁹⁰ See SBCA petition at 17. SBCA also points out that DBS companies generally do not know the location of the DBS antenna on the subscriber's property, and therefore it is inappropriate to rely on the DBS licensee to oversee the MVDDS survey process.

¹⁹¹ See EchoStar, DIRECTV joint petition at 21.

¹⁹² *Id.* at 22-23.

¹⁹³ MDS America petition at 24.

¹⁹⁴ Northpoint consolidated response at 14.

¹⁹⁵ See ET Docket No. 92-9, specifically, the *First Report and Order and Third Notice of Proposed Rulemaking*, 7 FCC Red 6886 (1993), at Appendix A, pages 6896-6897.

adopt excessively detailed negotiation requirements between licensees in situations involving the obligation of one service to pay for and install replacement facilities for licensees of another service on a nationwide basis.¹⁹⁶ Instead, the Commission provided only general guidelines, along with the requirement that the parties deal in good faith. In this manner, the Commission left it to the parties to determine the specific details of negotiating a resolution consistent with our general rules, timelines and procedures. We believe that the same broad approach should be workable and beneficial here.

68. For additional perspective on our decision, we also make the following observations. As an initial matter, we believe that petitioners' arguments greatly distort the rules and procedures that were adopted by consistently exaggerating the rare exception and making it the norm. For example, whereas petitioners paint a picture of pervasive harmful interference to DBS, we believe that the chances of harmful interference occurring are negligibly small. Regarding the petitioners' fear that MVDDS will not conduct an accurate or complete survey that is required by Section 101.1440(b), we believe that MVDDS licensees acting in good faith can readily conduct fully adequate surveys in light of our related discussions in the *Second R&O*. Indeed it is in their best interest to perform a survey as accurate as possible, since they assume all of the risk in the first year of MVDDS operation, *i.e.*, they must correct interference or cease operation if they cause harmful interference to or exceed the permitted EPFD limits to a DBS customer of record.¹⁹⁷ We do not eliminate the site survey requirement, as MDS America requests, because we conclude that the proper site selection and design of the MVDDS transmitter depends in large part on conducting a site survey of DBS receive locations. It is thus proper to require the MVDDS operator to perform such a survey and share its results with the DBS provider, rather than shift the burden to the DBS provider to analyze the proposed MVDDS transmitter characteristics and the impacts on DBS customers. We thus affirm our decision and conclude that a site survey, in conjunction with other adopted procedures, will protect DBS customers.

69. Concerning the petitioners' criticism that the 45 day response time of Section 101.1440(d)(2) provided to the DBS provider is arbitrarily short, we note that the Commission decided upon the adopted time frame based upon all the information of record and in light of our best judgment of what would, on balance, be equitable to all parties and would be in the public interest. In particular, the Commission concluded that the time frame provides a reasonable balance between the needs of DBS licensees to ensure protection of their customers before MVDDS begins operation while affording MVDDS licensees the ability to initiate service on a reasonably expeditious basis. Further, DBS customers are protected once MVDDS begins operation because, as noted above, the MVDDS provider must correct interference or cease operation if they cause harmful interference to or exceed the permitted EPFD limits to a DBS customer of record. We thus affirm our decision and conclude that the 45 day response period provides adequate protection for DBS customers.

70. Some petitioners also express concern regarding the requirement of Section 101.1440(d)(2) to provide a list of DBS customers that began service within 30 days after the MVDDS notice is provided and the possible uses to which such information could be put. MDS America has proposed an alternative procedure whereby the DBS entity only identifies those locations of DBS customers of record that they believe would receive harmful interference from the proposed MVDDS transmitter. We believe that this alternative approach has some merit in this case. Consequently, we will modify Section 101.1440(d)(2) to allow DBS providers to identify only those new DBS customers of record which they believe would receive harmful interference from the proposed MVDDS transmitter, rather than identify all new customers during the 30 day period. This approach addresses the desire of the DBS licensees to protect

¹⁹⁶ For the *18 GHz Relocation* proceeding see *Report and Order*, IB Docket No. 98-172, 15 FCC Rcd 13430 (2000) at ¶76 et seq; and for the *2 GHz Relocation* proceeding see *Second Report and Order and Second Memorandum Opinion and Order*, ET 95-18, 15 FCC Rcd 12315 (2000), at ¶¶70-74.

¹⁹⁷ 47 C.F.R. § 101.1440(g).

information that they believe is competitively sensitive while ensuring that the MVDDS operator has an opportunity to protect DBS customers from interference. We note that this approach is consistent with other provisions in our rules which allow DBS providers to identify those DBS receive locations that they believe may have been missed in the site survey or where the prescribed EPFD limits could be exceeded.¹⁹⁸

71. Concerning a methodology for measuring EPFD values, we believe that any measurement techniques we might describe would artificially limit the flexibility of the licensees to perform these measurements, and may seemingly prohibit the use of a technique that is satisfactory for this purpose. It is up to the licensees to perform these measurements in accordance with good engineering practices, and we decline to provide a detailed measurement procedure for this case.

72. Concerning dispute resolution procedures, we clarify that the MVDDS transmitter can be turned on after expiration of the 90-day period specified in Section 101.1440. We believe that our EPFD contour methodology will reduce disputes to a minimum, and this time frame will ensure that licensees participate in conflict resolution in good faith. We do not believe that it would be in the public interest to hold hostage the implementation of a new service due to what we believe will be a negligible number of disputes in practice. We believe that the risk to DBS customers of record is minimal since our rules also provide that the MVDDS provider must correct interference or cease operation if they cause harmful interference to or exceed the permitted EPFD limits to a DBS customer of record.¹⁹⁹

B. Multichannel Video Distribution and Data Service Rules

1. Dismissal of Pending Applications

73. On January 8, 1999, April 18, 2000, and August 25, 2000, Northpoint, Pegasus, and SRL, respectively, filed applications and waiver requests for terrestrial use of the 12 GHz band with the Commission.²⁰⁰ On December 8, 2000, the Commission requested comment on the disposition of these waiver requests and applications.²⁰¹ The Commission asked, among other things, whether the *Ku-Band Cut-Off Notice*²⁰² and the November 24, 1998 *NPRM*²⁰³ gave adequate notice to all parties interested in filing applications for terrestrial use of the 12 GHz band.²⁰⁴

74. Subsequent to the release of the *First R&O and Further Notice*, Congress passed the *LOCAL TV Act*, requiring the Commission to provide for independent testing of technology proposed by

¹⁹⁸ 47 C.F.R. § 101.1440(d)(2).

¹⁹⁹ 47 C.F.R. § 101.1440(g).

²⁰⁰ Broadwave Albany L.L.C., *et al.*, Applications for Licenses to Provide a New Terrestrial Transport Service in the 12 GHz band, Various DMAs (filed Jan. 8, 1999); PDC Broadband Corporation Applications for Licenses to Provide Terrestrial Service in the 12.2-12.7 GHz Band in all DMAs (filed Apr. 18, 2000); Satellite Receivers, Ltd. Application for Licenses to provide Terrestrial Broadcast and Data Services in the 12.2-12.7 GHz Band in Illinois, Indiana, Iowa, Michigan, Minnesota and Wisconsin (filed Aug. 25, 2000).

²⁰¹ *First R&O and Further Notice*, 16 FCC Rcd 4096, 4217 ¶¶ 325-330

²⁰² *See Public Notice*, International Bureau Satellite Policy Branch Information: Cut-off Established for Additional Applications and Letters of Intent in the 12.75-13.25 GHz, 13.75-14.5 GHz, 17.3-17.8 GHz and 10.7-12.7 GHz Frequency Bands, Report No. SPB-141, 1998 WL 758449 (rel. Nov. 2, 1998) (*Ku-Band Cut-Off Notice*).

²⁰³ *November 24, 1998 NPRM*, 14 FCC Rcd 1131, 1138 ¶¶ 8-9.

²⁰⁴ *See First R&O and Further Notice*, 16 FCC Rcd at 4217-4219 ¶¶ 323-328.

applicants seeking to provide terrestrial service in the 12 GHz band.²⁰⁵ The Commission selected the MITRE Corp. (MITRE) to conduct this testing. MITRE filed its report detailing its testing on April 18, 2001.²⁰⁶

75. On May 23, 2002, the Commission dismissed the Northpoint, Pegasus and SRL applications and waiver requests as prematurely filed because there was inadequate notice to all entities interested in filing applications for licenses to provide terrestrial services in the 12 GHz band.²⁰⁷ In addition, the Commission determined that Section 1012 of the *LOCAL TV Act* does not limit the field of applicants for 12 GHz band terrestrial licenses only to those entities that filed an application with the Commission on or before enactment of the statute.²⁰⁸ In this connection, the Commission concluded that the underlying purpose of the *LOCAL TV Act* is to provide assurance that terrestrial operations in the 12.2-12.7 GHz band will not disrupt DBS service, and determined that this purpose is served by requiring MVDDS entities to comport with the rules established in this proceeding.²⁰⁹

76. *Discussion.* For the reasons set forth below, we affirm the Commission's disposition of the applications and waiver requests of Northpoint, Pegasus, and SRL. The Commission dismissed the applications because the *Ku-band Cut-Off Notice* did not provide adequate notice for all entities interested in filing applications for licenses to provide terrestrial services in the 12 GHz band.²¹⁰ Additionally, the Commission denied the associated waiver requests finding that no applicant satisfied the waiver

²⁰⁵ See Prevention of Interference to Direct Broadcast Satellite Services, Pub. L. No. 106-553, 114 Stat. 2762 § 1012 (2000) (codified at 47 U.S.C. § 1110) (*LOCAL TV Act*). Congress passed the LOCAL TV Act on December 21, 2000. This legislation reads as follows:

(a) Testing for Harmful Interference.-The Federal Communications Commission shall provide for an independent technical demonstration of any terrestrial service technology proposed by any entity that has filed an application to provide terrestrial service in the direct broadcast satellite frequency band to determine whether the terrestrial service technology proposed to be provided by that entity will cause harmful interference to any direct broadcast satellite service.

(b) Technical Demonstration.-In order to satisfy the requirement of subsection (a) for any pending application, the Commission shall select an engineering firm or other qualified entity independent of any interested party based on a recommendation made by the Institute of Electrical and Electronics Engineers (IEEE), or a similar independent professional organization, to perform the technical demonstration or analysis. The demonstration shall be concluded within 60 days after the date of enactment of this Act and shall be subject to public notice and comment for not more than 30 days thereafter.

(c) Definitions.-As used in this section:

(1) Direct broadcast satellite frequency band.-The term "direct broadcast satellite frequency band" means the band of frequencies at 12.2 to 12.7 gigahertz.

(2) Direct broadcast satellite service.-The term "direct broadcast satellite service" means any direct broadcast satellite system operating in the direct broadcast satellite frequency band.

²⁰⁶ The MITRE Corporation, "Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band" (filed Apr. 18, 2001).

²⁰⁷ (*Second R&O* 17 FCC Rcd 9614, 9696-97 ¶¶ 211-14).

²⁰⁸ *Id.* at 9702-03 ¶¶ 229-31.

²⁰⁹ *Id.* at 9703-04 ¶¶ 232-35. The Commission noted that those who propose operations that do not comport with the Commission's technical rules will be required to file a waiver petition, on which public comment will be sought. As part of the waiver process, the Commission determined that such entity must submit an independent technical demonstration of its equipment and technology, in compliance with the Act. *Id.* at 9704 ¶ 236.

²¹⁰ *Id.* at 9697 ¶ 213.

standard.²¹¹ However, Pegasus maintains that the Commission should interpret Section 1012 of the *LOCAL TV Act* to limit MVDDS licensing to those then-pending applicants that successfully participated in the independent testing.

77. Pegasus argues that it submitted a timely-filed application and successfully subjected its technology to testing. Consequently, it asserts that it was qualified to be an MVDDS licensee and the Commission should not have dismissed its application. Northpoint similarly argues that the Commission erred by dismissing its application.

78. We disagree with these assertions because the Commission did not dismiss their applications and deny their waiver requests because they did not satisfy the testing requirement. Rather, the Commission dismissed their applications because the Commission found that notice to file applications for terrestrial services was not “reasonably comprehensible” to interested parties and could not be made by implication.²¹²

79. In fact, the Commission determined that the *Ku-Band Cut-Off Notice* was completely silent concerning terrestrial use of the Ku-band.²¹³ Accordingly, the Commission found that Pegasus, Northpoint, and SRL did not properly file their applications. As a result, the Commission dismissed the applications without prejudice to refile when the Commission announces that it is accepting applications to provide terrestrial services in the 12 GHz band.²¹⁴ Section 1012 of the *LOCAL TV Act* does not require the Commission to grant any applications. It requires the Commission to provide for independent testing of any technology proposed “by an entity that has filed an application” when the Commission has entities before it that seek to provide terrestrial service in the 12 GHz band.²¹⁵ Section 1012 of the *LOCAL TV Act* also specifies certain parameters for the testing of technology proposed by “any pending application.”²¹⁶ At no point does the *LOCAL TV Act* mandate the grant of an application (especially an application filed in a defective manner without adequate notice), although Pegasus and Northpoint seek this interpretation of the *LOCAL TV Act*. We find this interpretation is counter to the public interest because it would encourage the filing of applications without adequate notice to all interested parties.

80. Instead of challenging the application dismissal and waiver denial, Pegasus and Northpoint maintain that the testing requirement of Section 1012 of the *LOCAL TV Act* limits the scope of potential applicants for the spectrum. Pegasus argues that the *LOCAL TV Act* requires the Commission to limit MVDDS licensing to the two qualified entities – Pegasus and Northpoint – that successfully participated in independent testing required by the Act.²¹⁷ Specifically, Pegasus asserts that because Section 1012(a) of the *LOCAL TV Act* expressly states that testing is required and is applicable to “any entity that has filed an application to provide terrestrial service,” and Congress did not address what future applicants would need to do, Congress clearly intended to limit MVDDS licensing to those then-pending applicants that

²¹¹ *Id.* at 9701-9702 ¶ 228.

²¹² *Id.* at 9697 ¶ 214.

²¹³ *Id.* at 9697 ¶ 213 citing *McElroy Electronics Corp. v. FCC*, 86 F.3d 248, 257 (D.C. Cir. 1996); *Ridge Radio Corp. v. FCC*, 292 F.2d 770, 773 (D.C. Cir. 1961); *Maxcell Telecom Plus, Inc. v. FCC*, 815 F.2d 1551 (D.C. Cir. 1987).

²¹⁴ *Id.* at 9697 ¶ 214.

²¹⁵ *Id.* at 9702 ¶ 230.

²¹⁶ *Id.*

²¹⁷ Pegasus Broadband Corporation Petition for Reconsideration at 4, n.12 (filed June 24, 2002) (Pegasus Petition). Pegasus submits that SRL did not participate in the MITRE testing, and thus is not eligible to participate in the licensing process.

successfully participated in the independent testing.²¹⁸ However, as noted previously, neither application was acceptable because interested parties did not receive notice and no technical rules existed to protect DBS. Consequently, the applications were defective as prematurely filed.

81. We further note that first, and foremost, on Congress' mind when it adopted Section 1012 of the *LOCAL TV Act* was to avoid harmful interference. If Congress had intended the Commission to grant the applications, it would have mandated that result. Because Congress did not mandate grant of the applications, we believe that our interpretation complies with the intent of Section 1012 of the *LOCAL TV Act*.

82. Northpoint and SRL agree with Pegasus that we should not accept an MVDDS application from entities that did not have applications on file at the time of the enactment of the statute. However, Northpoint limits the field of applicants to one (itself), because it argues that the MITRE report based its conclusions solely on Northpoint's technology as no one else submitted any equipment for testing.²¹⁹ On the other hand, SRL believes that the Commission should reinstate all three applications.²²⁰ SRL avers that Section 1012 of the *LOCAL TV Act* simply requires the Commission to ensure that any applicant proposing to deploy terrestrial operations do so without causing harmful interference to DBS operations.²²¹ In addition, SRL avers that the Act does not require then-pending applicants to propose any technology or limit the field of applicants to those that participated in the independent testing.²²²

83. Pegasus does not contest the Commission's conclusion in the memorandum opinion and order portion of the *Second R&O* that the underlying purpose of Section 1012 *LOCAL TV Act* is to require a determination of whether any proposed terrestrial service would cause harmful interference to any DBS service.²²³ This purpose comports with the Commission's determination that Congress did not intend for the statute to limit the scope of applicants for the spectrum to those on file at the time, because we do not believe, and Pegasus does not argue, that this goal requires a limitation on prospective MVDDS providers.

84. Pegasus argues that if Congress had intended the Commission to continue to accept later-filed applications, it could have been more explicit.²²⁴ In reviewing the statute, the Commission found that Section 1012(a)'s requirement that it provide for independent testing of any technology proposed by "any entity that has filed an application" covers points in time (present or future) when the Commission has before it applications filed by entities that seek to provide terrestrial service in the 12.2 – 12.7 GHz band.²²⁵ In contrast, the Commission determined that Section 1012(b) of the *LOCAL TV Act*, which

²¹⁸ *Id.*

²¹⁹ See Consolidated Response of Northpoint Technology, LTD., and Broadwave USA, Inc., to Petitions for Reconsideration of Second Report and Order at 3-4 (Northpoint Consolidated Response) (filed Sept. 3, 2002).

²²⁰ Satellite Receivers Ltd. Opposition to Petition for Reconsideration at 3 (filed July 12, 2002) (SRL Opposition).

²²¹ *Id.*

²²² *Id.*

²²³ See *Second R&O*, 17 FCC Rcd at 9702-04 ¶¶ 229-36; see also Joint Opposition of DIRECTV, INC. and EchoStar Satellite Corporation at 20 (filed Sept. 3, 2002) (DBS Opposition); MDS America, Incorporated Opposition to Petition for Reconsideration of Pegasus Broadband Corporation at 5 (filed Sept. 3, 2002) (MDS America Opposition).

²²⁴ See Pegasus Petition at 7.

²²⁵ See *Second R&O*, 17 FCC Rcd at 9702 ¶ 230.

provides the parameters for the testing of technology proposed by “any pending application,” is limited to applications pending as of the enactment of the *LOCAL TV Act*.²²⁶ As the Commission stated,

Had Congress intended Section 1012(a) to apply only to applications on file with the Commission at the time of enactment, it would have used terms such as “pending” and “date of enactment,” which it did in Section 1012(b). Moreover, if the entities covered by Section 1012(a) were limited to applications pending at the time of enactment, then the inclusion in Section 1012(b) of the phrase “pending application” would be superfluous.²²⁷

Pegasus’ proffered interpretation focuses solely on Section 1012(a) of the *LOCAL TV Act*, and ignores the rest of the statute.

85. We find that Pegasus’ argument is not persuasive. We agree with the DBS operators (EchoStar Satellite Corporation and DIRECTV, Inc.) and SRL that Pegasus has no basis in concluding that Congress explicitly ordered the Commission to limit terrestrial applications in this band to those already on file and validated by independent testing.²²⁸ Further, we agree that Congress did not intend to override the Commission’s normal license assignment procedures or to effectively grant a particular applicant or set of applicants a “pioneer’s preference” for licenses granted outside the Commission’s usual license assignment process.²²⁹ We believe that the Commission’s previous determination is supported by a reasonable interpretation of the statutory provision and is in the public interest.

2. Operational Limits

86. *EIRP and EPFD limits.* MDS America seeks reconsideration of the EIRP and EPFD operational limits on MVDDS set forth in Sections 101.105 and 101.113 of the rules adopted in the *Second R&O*. MDS America argues that we should adopt a two-tiered scheme that maintains the 14 dBm EIRP limit for urban areas but would allow a higher EIRP of 39 dBm in rural areas.²³⁰ Similarly, MDS America argues that the regional EPFDs should also be increased in rural areas.²³¹ MDS America contends that the higher EIRP and EPFDs are appropriate in rural areas because they will simultaneously allow for larger MVDDS service areas while making it possible to increase DBS interference protection through control of the radiation beam (or vector) from the MVDDS transmitter.²³² In addition, MDS

²²⁶ See *Second R&O*, 17 FCC Rcd at 9702-04 ¶¶ 229-36; see also *DBS Opposition* at 13; *MDS America Opposition* at 5-6.

²²⁷ *Second R&O*, 17 FCC Rcd at 9702-03 ¶ 231 (footnotes omitted).

²²⁸ See *DBS Opposition* at 14; *SRL Opposition* at 3. We note that Congress rescinded our authority to issue “pioneer’s preference” awards in 1997, under a provision of the Balanced Budget Act of 1997. Pub. L. 105-33, 111 Stat. 251 (1997); 47 U.S.C. § 309(j)(13).

²²⁹ See *DBS Opposition* at 15-16.

²³⁰ MDS America petition at i – ii, and generally at 2, 6 and 22.

²³¹ The four EPFD values specified by MDS America for rural areas are -155.7, -157.7, -158.6 and -160 dBW/m²/4kHz. *Id.* at 23

²³² MDS America contends that the MVDDS transmitter could be placed at a relatively high altitude above the surrounding terrain and the antenna beam could be shaped and pointed so that the MVDDS signal does not illuminate the ground within a significant “exclusion zone” around each MVDDS transmitter. In theory, as a result, any nearby DBS receive dishes within the “exclusion zone” would not see the MVDDS signal because it is essentially directed to travel overhead and out of the propagation line of sight for nearby DBS receivers. MDS America contends that “Exclusion zones, therefore, are not areas of higher interference, but rather areas of NO interference to DBS customers, because they are areas with the weakest MVDDS signal.” Thus MDS asserts that

(continued...)

America argues that this higher power limit will allow MVDDS operators to avoid potential multipath problems that can occur with transmitters located in urban areas by making it feasible to locate transmitters farther outside an urban area while still providing service within the urban area due to the larger coverage contours achieved.²³³ Finally, MDS America also argues that these higher limits will permit service areas of sufficient size for economic viability, thereby making it more likely that MVDDS will be deployed in rural areas. Finally, MDS America argues that the EIRP limits adopted in the *Second R&O* have the effect of favoring MVDDS systems configured in a manner similar to the original Northpoint proposal.

87. We decline to modify the EIRP and EPFD limits imposed on MVDDS. Two key benefits of the adopted limits are that they are not susceptible to dispute because of their simplicity, and they effectively limit the potential for harmful interference to DBS when applied to all MVDDS transmission systems, no matter how configured. As the Commission found in the *Second R&O* and affirm herein, these limits are sufficiently conservative to ensure that any potential interference to DBS should be held below any level that can be considered harmful under our rules. As noted in the preceding paragraph, however, MDS America relies upon certain assumptions about the MVDDS transmitting antenna characteristics – particularly, the vector angle of the transmitted beam - to achieve the asserted benefits of their approach²³⁴. In other words, the level of DBS protection claimed by MDS America will not result at the higher EIRP unless various antenna characteristics assumed by MDS America are met. In that light, we conclude that adopting rules that specify an EIRP higher than 14 dBm would inherently necessitate the adoption of additional constraints on MVDDS transmitting antenna characteristics that could unduly limit the flexibility and options of MVDDS providers to use alternative antenna configurations. By comparison, the adopted limits do not preclude the use of the MDS America approach to MVDDS transmission, although we recognize MDS America's argument that those limits could make some approaches more or less attractive for various financial and technical reasons. However, on balance, we believe it is prudent to craft a conservative criterion that protects DBS in all instances and preserves the flexibility for each MVDDS provider to make its own business decision about what type of transmission system better suits its needs. Finally, we note that the relief sought by MDS America would require the formulation of some across-the-board definition of what constitutes a "rural" area for the purpose determining when the EIRP and EPFD exceptions would apply. We conclude that making such an exception would negate the benefit of the simplicity and general applicability of the adopted rules. Accordingly, the MDS America petition for higher EIRP and EPFD limits on MVDDS is denied.

88. On the other hand, we do not prejudge herein whether the MDS America rationale for higher EIRP and EPFD limits in rural areas might have some technical merit in certain very specific circumstances. Consequently, MVDDS providers may file petitions for waiver of the general MVDDS limits adopted in the *Second R&O*.²³⁵ After we gain experience with MVDDS operations, we will entertain requests to modify the general EPFD and EIRP limits, if such experience provides sufficient justification for such action.

89. *24 megahertz bandwidth*. MDS America requests that we clarify the bandwidth restriction specified in the MVDDS emission mask rule.²³⁶ Specifically, MDS America argues that the footnote

(...continued from previous page)

higher EIRPs can be utilized without causing harmful interference to nearby DBS receive dishes because the radiated MVDDS signal is not directed toward their line of sight. MDS America petition at 14.

²³³ MDS America petition at i.

²³⁴ *Id.* at 12 – 22. See also footnote 330 *supra*.

²³⁵ In these situations, we encourage MVDDS providers to consult with and hopefully secure support from each potentially affected DBS provider.

²³⁶ *Id.* at 23.

added immediately after the definition of “B” in Section 101.111(a)(2)(i) appears to restrict the channelization plan of MVDDS providers within their band. MDS America notes that while the Commission stated that the 500 megahertz MVDDS allocation could be divided into any size channels, it also adopted an emission mask equation with a maximum authorized bandwidth of 24 megahertz. That emission mask, MDS America argues, could be interpreted as a limit on in-band channelization. In that light, MDS America requests clarification of the apparent inconsistency.

90. We agree that some clarification of our rules is appropriate. The emission requirement should be applied only at the band edge to limit undesired MVDDS signals outside of the 12.2-12.7 GHz band. This out-of-band emission limit was not intended to limit channelization within the 12.2-12.7 GHz band, but is necessary to set the authorized bandwidth value “B” to 24 megahertz to ensure the equation effectively protects operations in adjacent bands (*i.e.*, if B was set to 500 megahertz, the energy permitted by Section 101.111(a)(2)(i) into adjacent bands would have been much higher). We amend the footnote to add the proviso that the emission mask only applies at the 12.2 -12.7 GHz band edges and does not restrict MVDDS channelization bandwidths within the band.

91. *MVDDS antenna pointing.* EchoStar and DIRECTV argue that the Commission ignored the findings of the *MITRE Report* concerning orientation of MVDDS transmitters.²³⁷ Specifically, they assert that our rules compound the potential for harmful interference to DBS by failing to specify any directional orientation for MVDDS transmitting antennas.²³⁸

92. *Decision.* We disagree. Petitioners do correctly point out that Northpoint's proposal involves south-pointing transmitters based upon their contention that such an orientation would avoid interference with DBS in the same spectrum.²³⁹ However, the *MITRE Report* stated that MVDDS antenna orientations, other than southward as envisioned by the original MVDDS applicants, could have beneficial effects.²⁴⁰ In other words, the *MITRE Report* found that it was not essential that MVDDS transmitters point south. The Commission stated its agreement with *MITRE* in our decision in the *Second R&O*.²⁴¹ The Commission also noted that *MITRE* found that MVDDS antenna orientations other than south, including north, created no more interference, but that care must be taken not to place the antenna too close to the line of sight between a satellite and a DBS receiver.²⁴² In other words, different antenna orientations present varying interference protection geometries that should be considered to avoid locating an MVDDS transmitter too close to the line of sight between a satellite and a DBS receiver. Taking these matters into consideration, the Commission found that of all these variables “[i]nterference protection is what is important ...”²⁴³ Therefore, the Commission concluded that it should shift the focus from proposals that specify particular antenna orientations to the objective of protecting DBS while allowing flexibility for MVDDS technical innovation - particularly in regard to antenna configurations.²⁴⁴ Since the EPFD accounts for antenna orientation, all parties are protected no matter what their relative directions are. Based upon these findings, and in light of the other interference protection criteria

²³⁷ *Id.* at 11-12. [EchoStar, DIRECTV petition] The *MITRE Report* states that “pointing the MVDDS transmitting antennas away from the satellites, rather than toward them as generally envisioned, could have beneficial effects in many situations ...” See also *MITRE Report* at 6-2.

²³⁸ EchoStar, DIRECTV petition at 12.

²³⁹ *Id.* at 12. Citing Northpoint Petition for Rulemaking (filed March 6, 1998) at 4.

²⁴⁰ *Id.* at 12. Citing *MITRE Report* at xviii, 6-2.

²⁴¹ *Second R&O* at ¶ 202.

²⁴² *Second R&O* at ¶ 202. Citing *MITRE Report* at 6-2 to 6-4.

²⁴³ *Second R&O* at ¶ 202.

²⁴⁴ *Second R&O* at ¶ 202.

adopted, the Commission concluded in the *Second R&O* that the direction of MVDDS antennas depends on the total circumstances.²⁴⁵ Our decision reflects the judgment that any potential for harmful DBS interference - regardless of the MVDDS antenna orientation - can be resolved through careful MVDDS selection of the antenna site and modest self-mitigation measures by DBS subscribers. Furthermore, by placing EPFD and EIRP limits on the MVDDS we have placed very conservative constraints on the amount of power that can be seen by the DBS antenna, and consequently limited the potential that interference could occur.

C. NGSO FSS Issues

93. In the *First Report and Order*, the Commission authorized MVDDS fixed operations and NGSO FSS service downlinks in the 12 GHz band on a co-primary basis.²⁴⁶ In the *Second R&O*, the Commission adopted technical rules to govern spectrum sharing between NGSO FSS and MVDDS in the 12 GHz band. In order to protect NGSO FSS operations, the Commission decided that the MVDDS signal must meet a power flux density (PFD)²⁴⁷ limit of $-135 \text{ dBW/m}^2/4\text{kHz}$ measured or calculated at the surface of the earth at distances greater than 3 km from the MVDDS transmitting site.²⁴⁸ The Commission adopted a minimum MVDDS transmitting antenna spacing of 10 km from pre-existing NGSO FSS receive antennas.²⁴⁹ The Commission also adopted an MVDDS emission mask for protecting NGSO FSS operations in the adjacent 11.7-12.2 GHz band and Cable Television Relay Service (CARS) and Broadcast Auxiliary Service (BAS) operations in the adjacent 12.7-13.25 GHz band from out-of-band MVDDS emissions.²⁵⁰ In order to protect MVDDS receivers from NGSO FSS interference for the portion of the non-geostationary orbital path near the horizon, the Commission adopted low elevation angle PFD radiation limits on NGSO FSS satellites.²⁵¹ Specifically, the Commission decided that NGSO FSS downlinks at angles of 0-2 degrees above the horizon shall not exceed a PFD of $-158 \text{ dBW/m}^2/4\text{kHz}$, and at angles of 2-5 degrees above the horizon shall not exceed a PFD limit of $-158+3.33(\delta-2) \text{ dBW/m}^2/4\text{kHz}$.²⁵² The Commission decided that an NGSO FSS applicant must demonstrate, prior to becoming operational, that it meets the adopted low angle PFD limits to protect MVDDS. Finally, the Commission also adopted rules requiring NGSO FSS operators to maintain and share a database of existing NGSO FSS receiver locations. Similarly, MVDDS operators are required to maintain and share with NGSO FSS operators a database of existing and proposed MVDDS transmitting locations, EIRP, tower height and related technical information.²⁵³

²⁴⁵ *Second R&O* at ¶ 202.

²⁴⁶ *First R&O*, 16 FCC Rcd 4160 at ¶¶ 166-167.

²⁴⁷ PFD is a measure of the amount of energy emitted by a transmitter that is present over a unit area at the Earth's surface or at the satellite, and is a critical factor in determining whether satellite systems can successfully share spectrum with other services or satellite systems.

²⁴⁸ *Second R&O* at ¶ 112. 47 C.F.R. §101.105(a)(4)(i).

²⁴⁹ *Id.* at ¶ 123. 47 C.F.R. §101.129(b).

²⁵⁰ *Id.* at ¶ 120. 47 C.F.R. §101.111(a)(2)(i).

²⁵¹ *Id.* at ¶ 120. 47 C.F.R. §25.208(k). [*Second R&O*] Satellites in non-geostationary orbit are in constant motion around the Earth. When they are near the horizon, their elevation angles are sufficiently low that it is possible for the satellite transmitter to be pointed at a terrestrial MVDDS receiving antenna.

²⁵² Where δ is defined as the angle of arrival above the horizontal plane.

²⁵³ *Second R&O* at ¶ 124. 47 C.F.R. §§ 25.139 and 101.103

1. MVDDS Limits.

94. *Positions of the Parties.* SkyBridge argues that the PFD limit imposed on MVDDS operations fails to provide any meaningful protection to later-in NGSO FSS systems²⁵⁴ because, they assert, it is the percentage of affected NGSO FSS user terminals within an MVDDS service area that is the critical parameter for assessing the burden on NGSO FSS systems. To remedy this, SkyBridge urges the Commission to adopt rules that reflect its originally proposed sharing scheme that focuses upon multiple PFD and EPFD limits in prescribed percentages of MVDDS service area.²⁵⁵ SkyBridge argues that the Commission failed to demonstrate that the SkyBridge proposal is overly complex or burdensome and failed to show any relationship between the adopted rules and the protection requirements of NGSO FSS systems.²⁵⁶ Additionally, SkyBridge objects to the Commission's conclusion that NGSO FSS systems can employ frequency diversity²⁵⁷ and can prevent saturation when doing so via sufficient signal discrimination characteristics and/or narrower receiver front ends.²⁵⁸ SkyBridge argues that the cost of such modifications on system design together with other engineering constraints of supporting frequency diversity would effectively result in a bar on economically viable NGSO FSS operations in the 12.2-12.7 GHz band, and relinquishment of the band to the unrestricted use of MVDDS operations.²⁵⁹ This, they contend, would effectively relegate NGSO FSS to *de facto* secondary status because MVDDS is likely to deploy before NGSO FSS in most areas.²⁶⁰ In that connection, SkyBridge contends that its sharing scheme would allow both NGSO FSS and MVDDS operators to co-exist, no matter which service deployed first in a given area. Finally, SkyBridge argues that the Commission adopted the -135 dBW/m²/4kHz PFD limit at 3 km merely to accommodate the EIRP of 14 dBm recommended in the MITRE Report regarding DBS protection rather than for the purpose of protecting NGSO FSS. It asserts that the adopted limits only protect NGSO FSS receivers from saturation, but do not protect against unacceptable interference.²⁶¹

95. Arguing against the requests of SkyBridge, MDS America asserts that SkyBridge's petition merely repeats arguments that were fully considered and rejected by the Commission in the *Second R&O*. It also argues that mere disagreement with Commission decisions does not support reconsideration and that the Commission's decisions demonstrate a careful consideration of the record and a reasonable policy decision that should be accorded a substantial degree of deference.²⁶² Similarly, Northpoint argues that

²⁵⁴ SkyBridge petition at 4.

²⁵⁵ SkyBridge proposed a scheme involving multiple in-band PFD contours and EPFD defined zones and out-of-band emission limitations. The three in-band limits SkyBridge proposed were: 1) a PFD limit of -120 dBW/m²/MHz (which equates to -144 dBW/m²/4kHz) corresponding to an NGSO FSS frequency diversity zone that SkyBridge suggests should not be exceeded over ten percent of the MVDDS service area; 2) an EPFD limit of -135 dBW/m²/4kHz corresponding to a NGSO FSS receiver saturation buffer zone that should not be exceeded over 0.2% of the MVDDS service area; and 3) an EPFD limit of -132 dBW/m²/4kHz corresponding to a NGSO FSS receiver saturation threshold limit not to be exceeded into any operational NGSO FSS receiver. *See* SkyBridge comments at 33-47. *See, also*, SkyBridge *ex parte* letter from Jeffrey H. Olson to Magalie Roman Salas, Secretary, FCC (filed Jul 10, 2000).

²⁵⁶ SkyBridge petition at 10.

²⁵⁷ NGSO FSS is allocated the entire 11.7-12.7 GHz band for downlink operation. Frequency diversity techniques would enable dynamic switching to the lower 11.7-12.2 GHz band for downlink service to avoid potential MVDDS interference in the 12.2-12.7 GHz band.

²⁵⁸ SkyBridge petition at 12.

²⁵⁹ *Id.* at 13.

²⁶⁰ *Id.* at 13.

²⁶¹ *Id.* at 8.

²⁶² MDS America opposition at 3.

the Commission properly considered and rejected Sky Bridge's proposed MVDDS protection scheme as being needlessly complex.²⁶³

96. Northpoint states that SkyBridge never placed its receiver specifications in the record and, consequently, there is insufficient evidence of the claimed receiver characteristics relied upon by SkyBridge to support its approach. As to the limits that were adopted, Northpoint and MDS America argue that the PFD limit at 3 km is too restrictive and should be repealed.²⁶⁴ Northpoint adds that the PFD limits were adopted without adequate support in the record and are unnecessarily restrictive on MVDDS given that NGSO FSS receivers will have unfettered access to the sub-adjacent 11.7-12.2 GHz band.²⁶⁵ MDS America argues that the potentially preclusive effect of the PFD limit on MVDDS operations could be considerable – especially in rural areas, yet may be of little benefit for NGSO FSS given that the limit applies regardless of whether an NGSO FSS receiver is ever deployed near the MVDDS transmitter. As an alternative, MDS America asks that the PFD limit be modified for rural areas to $-109 \text{ dBW/m}^2/4\text{kHz}$ at a distance greater than 3 km from the MVDDS transmitter to accommodate its request for higher MVDDS transmitter EIRP limits.²⁶⁶

97. *Decision.* We decline to reconsider the MVDDS limits adopted in the *Second R&O* and find SkyBridge's assertion that the $-135 \text{ dBW/m}^2/4\text{kHz}$ PFD limit at 3 km fails to provide later-in NGSO FSS systems with meaningful protection to be without merit. While SkyBridge might disagree with the PFD limits that were adopted, mere disagreement in the absence of new information does not merit reconsideration in light of our balanced consideration of the interests of both NGSO FSS and MVDDS. The Commission found in the *Second R&O* that the PFD limit was a sensible compromise between NGSO FSS and MVDDS proposals that would provide reasonable protection to NGSO FSS systems without limiting the service area of each MVDDS transmitter. We find that SkyBridge presents no new information in its petition that was not previously considered in the *Second R&O*. Nevertheless, we note that in the *Second R&O*, the PFD limit was analyzed in terms of SkyBridge's multi-limit scheme and found to provide qualitatively similar protection to that sought by SkyBridge.²⁶⁷ Concerning SkyBridge's questioning of the relationship between the PFD limit and the 14 dBm EIRP limit, we find that it was reasonable for the Commission to analyze whether MVDDS operating at the EIRP limit originally conceived and ultimately adopted for DBS protection would similarly provide adequate protection for NGSO FSS. The Commission concluded that such MVDDS operation was both compatible with the PFD limit and consistent with a reasonable level of NGSO FSS protection.

98. Concerning the relative merits of SkyBridge's proposed scheme and why it was not adopted, the Commission concluded in the *Second R&O* that the SkyBridge scheme was technically unsound and

²⁶³ Northpoint consolidated response at 15-17.

²⁶⁴ See generally, MDS America's June 24, 2002 Petition for Reconsideration at 12 and the September 3, 2002 Consolidated Response of Northpoint Technology, LTD., and Broadwave USA, Inc., to Petitions for Reconsideration of the Second Report and Order at 8, 13, and 15-17.

²⁶⁵ Northpoint consolidated response at 13.

²⁶⁶ MDS America petition at 26.

²⁶⁷ Based upon worst case assumptions without frequency polarization constraints on MVDDS, the adopted technical limits should allow NGSO FSS deployment across 80% of the MVDDS service area in the entire 11.7-12.7 GHz band and up to 97.5% of the MVDDS service area if the NGSO FSS terminal uses frequency diversity to operate in the adjacent 11.7-12.2 GHz band. See *Second R&O* at ¶116. SkyBridge has argued that it was desirable to avoid use of frequency diversity "over a large proportion" of the MVDDS service area, and that the NGSO FSS "saturation zone" should be "small." SkyBridge comments to *FNRPM* at 33-34. As shown, under worst case assumptions the saturation zone corresponding to our adopted rules is approximately 2.5% of the MVDDS service area. Although not as small as the 0.2% of the MVDDS service area that SkyBridge proposed, it is sufficiently small as to not substantially hinder NGSO FSS deployment.

needlessly complex. First, as a practical matter, we continue to find that basing PFD limits on a percentage of MVDDS service area would be inordinately burdensome and could be susceptible to litigation dispute and manipulations among competing licensees with respect to parameters such as MVDDS service area size.²⁶⁸ In this regard, SkyBridge has provided little plausible guidance about how their approach could be effectively implemented and enforced. Second, we are not persuaded by SkyBridge's assumptions that imply a direct correlation between the percentage of MVDDS service area and a numerical percentage of NGSO FSS terminals that either may experience interference or be required to make use of frequency diversity. SkyBridge appears to base its arguments either on an assumption of uniform NGSO FSS deployment across an MVDDS service area or on the assumption that both NGSO FSS and MVDDS will be uniformly distributed across the Nation. We believe that neither assumption is realistic. Finally, as SkyBridge itself implicitly confirmed, the percentage limits for the various PFDs sought are not physically realizable over a wide range of MVDDS operating parameters unless MVDDS transmissions are restricted to cross-polarized transmission modes with respect to NGSO FSS.²⁶⁹ The Commission rejected polarization constraints on MVDDS as being too burdensome and likely to hinder evolution of that service.²⁷⁰ Moreover, the Commission determined that defining NGSO FSS protection in terms of MVDDS service area percentages was illusory as a technical sharing rule because virtually any reasonable combination of EIRP and tower height limits would result in a nearly constant percentage of affected MVDDS service area.²⁷¹ In other words, no matter how large or small the MVDDS EIRP or antenna height, the result in terms of affected service area percentages would be nearly unchanged. Furthermore, as demonstrated in the *Second R&O*,²⁷² the actual physical extent of all three of the complex protection contours described by SkyBridge could be just as completely characterized, and more effectively regulated, by specifying a single, easily controllable, PFD limit on an MVDDS transmitter.

99. In essence, we find that SkyBridge's complaint regarding the adopted PFD limit reduces to little more than dissatisfaction that it will not have unfettered use of the 12 GHz band in locations where it is deployed after MVDDS and that this renders NGSO FSS secondary to MVDDS. We find that the fact that NGSO FSS interests might not be ready to deploy before MVDDS due to marketplace, financial or other concerns is insufficient basis for reconsideration of our balanced approach. SkyBridge cites no authority to support such preferential treatment under such circumstances. We similarly reject SkyBridge's complaint that additional expense for equipment design might be required to take full advantage of frequency diversity under these circumstances. As the Commission stated in the *Second R&O*, "[i]n these circumstances, each NGSO FSS operator can make its own business decision whether to employ receivers with sufficient signal discrimination characteristics and/or narrower bandwidth front-

²⁶⁸ *Second R&O* at ¶ 118.

²⁶⁹ *Id.* at ¶ 115, footnote 256, citing SkyBridge *ex parte*, Letter from Jeffrey H. Olson, Paul, Weiss, Rifkind, *et al.* to Magalie Roman Salas, Secretary, FCC (filed Nov. 15, 2001). In particular, SkyBridge assumed that MVDDS would use a single polarization mode of transmission dissimilar to that used for NGSO FSS. We find this assumption unrealistic because, among other reasons, there are no guarantees regarding which polarization different NGSO FSS licensees may use to share the band and it does not consider polarization effects on sharing with DBS. Moreover, for example, such constraints on MVDDS transmissions could seriously impede a provider's flexibility to utilize lower power spreading modulation techniques that may use both polarizations to achieve greater capacity needs.

²⁷⁰ *Second R&O* at ¶ 115. In addition, For example, Northpoint argues that to meet SkyBridge's -120 dB W/m²/MHz limit over 90% of its service area, it would have to reduce its overall maximum PFD on the ground to the -120 dB W/m²/MHz level with a corresponding EIRP of -33.5 dBW, which would reduce its predicted service area radius to 1.5 miles, greatly increasing the number of transmit sites needed. Northpoint January 14, 2002 *ex parte* at 5.

²⁷¹ *Second R&O* at ¶ 117.

²⁷² *Id.* at ¶¶ 115-117.

ends to enable operation in close proximity to pre-existing MVDDS transmitting antennas.”²⁷³ Furthermore, we find that it is unrealistic for later-in NGSO FSS systems to expect total technical flexibility and to also have unfettered access to the 12.2 GHz band without consideration of existing co-primary MVDDS transmitters. As stated in the *Second R&O*, it was our intention to afford more and easier use of spectrum to the first-in service in any particular area.²⁷⁴ We find that adopting the level of NGSO FSS protection desired by SkyBridge would undermine that goal and would place severe restrictions on MVDDS operations that could preclude viable MVDDS operations. As Northpoint aptly observes, in the few instances where interference might pose a problem to NGSO FSS/MVDDS sharing of the 12 GHz band, the NGSO FSS systems can operate in adjacent spectrum - just as they might be required to do whenever an NGSO FSS receiving antenna might be pointed at another NGSO FSS system's transmitter.²⁷⁵ In short, we conclude that the adopted limits strike a balance between the interests of enabling the widespread deployment of these two new services while affording a reasonable degree of protection to whichever service is later to enter a particular market. We find that the adopted limits are consistent with the co-primary status of MVDDS and NGSO FSS in the 12.2-12.7 GHz band and reject SkyBridge's argument to the contrary.

100. Therefore, we affirm the conclusion reached in the *Second R&O* that the approach which limits the MVDDS PFD at a specified distance affords NGSO FSS adequate interference protection from MVDDS. Moreover, it is relatively simple to determine and easy to apply because it will not be susceptible to arbitrary assumptions by licensees.²⁷⁶ Finally, the Commission found that the adopted approach fixes the potential worst-case NGSO FSS interference regardless of MVDDS transmitter or antenna design.²⁷⁷ Consequently, the Commission concluded that both MVDDS and NGSO FSS licensees would benefit from the predictability of being able to anticipate and plan around the potential sharing issues that might arise.²⁷⁸ We recognize that the adopted PFD limit is not as favorable for NGSO FSS as SkyBridge desired, however we affirm our conclusion that the adopted PFD limit at 3 km for MVDDS represents a reasonable compromise that will allow NGSO FSS access to a large percentage of any area where a MVDDS transmitter is deployed. At the same time, this limit should allow each MVDDS transmitter to viably serve a reasonably adequate geographic area without resorting to an excessive number of transmitters. In light of the discussion and findings in the preceding paragraphs, we find no merit in SkyBridge's contention that its percentage based approach failed to receive sufficient consideration or that it is superior to the method adopted in the *Second R&O*.

101. With respect to MDS America's petition to relax or repeal the MVDDS PFD limit, we find that the preceding discussion about why the PFD limit of $-135 \text{ dBW/m}^2/4\text{kHz}$ at 3 km should not be tightened as requested by NGSO FSS petitioners simultaneously militates against relaxing the PFD limit as requested.²⁷⁹ In short, we conclude that relaxing the PFD limit could have a sufficiently deleterious effect on the ability of future NGSO FSS systems to provide service within significant portions of an MVDDS transmitter's service area. Therefore, for the same reasons discussed above, we affirm the conclusion that the adopted PFD limit ultimately reflects our best judgment of what standards would, on

²⁷³ *Id.* at ¶ 109.

²⁷⁴ *Id.* at ¶ 111.

²⁷⁵ Northpoint consolidate response at 18. *See also*, *Second R&O* at ¶ 108.

²⁷⁶ *Second R&O* at ¶ 113.

²⁷⁷ *Id.* The Commission also found that the PFD limit is technology neutral for MVDDS because it allows for the use of any antenna type, tower height and EIRP combination (up to the maximum 14 dBm) so long as the PFD limit is not exceeded at the specified distance.

²⁷⁸ *Id.* at ¶ 113.

²⁷⁹ *See* para. 86, *supra* for a discussion of MDS America's request for higher MVDDS EIRP limits.

balance, be both workable and beneficial for both services. Moreover, given that neither MVDDS nor NGSO FSS are currently operational, we find that it was prudent, based upon the best information of record, to craft the technical rules in a conservative manner that strikes what we judge to be a reasonable compromise between the competing interests of each service. Therefore, we deny MDS America's request to relax the PFD requirements in rural areas.

102. Finally, we note that Northpoint's consolidated response included a request that we repeal the rule requiring later installed MVDDS transmitters to maintain a 10 km separation from established NGSO FSS receive sites. Because this request was first raised in Northpoint's response to SkyBridge's petition for reconsideration, it cannot be considered as a timely filed request for reconsideration. Therefore, we dismiss this request as untimely. Nevertheless, for the purpose of clarity, we note that the adopted rules are designed to provide the first-deployed service with interference protection from the later-deployed service. In this instance, if NGSO FSS is first deployed, it will likely make use of the full 12.2-12.7 GHz band available to it. The nearby presence of later deployed MVDDS transmitters in an area already served by NGSO FSS could require both existing and future NGSO FSS receivers within that area to tune out of the 12.2-12.7 GHz band then being used and into the lower 11.7-12.2 sub-band available to NGSO FSS in order to avoid interference from MVDDS. We also note that Section 101.129(b) of the adopted rules allow for NGSO FSS and MVDDS licensees to agree to separations less than 10 km without limit. Moreover, since MVDDS is co-primary with NGSO FSS, MVDDS will be able to deploy in any location wherever they are the first entrant.

2. NGSO FSS Limits.

103. *Positions of the Parties.* SkyBridge argues that the low angle PFD limits of Section 25.208(k) imposed on NGSO FSS downlink transmissions in the 12 GHz band to protect MVDDS receivers are unnecessarily burdensome because they based on worst case assumptions and would apply at all times (*i.e.* "hard limit").²⁸⁰ SkyBridge explains that it previously accepted Northpoint's proposed PFD limits,²⁸¹ which are 10 dB tighter than those specified in Article 21 of the International Radio Regulations for protecting fixed service receivers in the 12.2-12.7 GHz band, in an effort to meet a mutual sharing agreement, provided that the method adopted for implementing the tighter limits would not impose unnecessary constraints on NGSO FSS systems. While acknowledging that its system would meet the more restrictive limits in most cases, SkyBridge argues that adopting the PFD limit as a "hard limit" requires that the NGSO FSS system be designed to meet the limit under worst-case conditions. SkyBridge contends that such a constraint means that NGSO FSS systems must operate at power levels lower than the PFD limit needed to protect the majority of MVDDS receivers.²⁸² SkyBridge states that it would not oppose rules that would require an NGSO FSS licensee to provide the Commission with an assurance of an NGSO FSS system's ability to comply with limits prior to the start of service. However, SkyBridge urges that an NGSO FSS licensee should only have to demonstrate compliance with adopted limits on an "operational" basis; that is, upon a credible claim of harmful interference into identified operational MVDDS receivers.²⁸³ SkyBridge recommends that instead of requiring a demonstration of compliance with the tighter limits prior to commencement of operation, the Commission should require only the information it needs to insure that an NGSO FSS operator has taken into account the need to

²⁸⁰ SkyBridge petition at 14. SkyBridge asserts that the worst case for sharing between MVDDS and NGSO FSS would occur when the MVDDS receive site is at the edge of the coverage area (*i.e.*, receiving a weak signal), and the NGOS FSS satellite is operating at maximum power and the NGSO satellite transmit antenna is aligned with the MVDDS receive antenna. SkyBridge contends that this scenario rarely occur.

²⁸¹ The Commission adopted the PFD limits proposed by Northpoint and agreed to by SkyBridge.

²⁸² SkyBridge Petition at 15-16.

²⁸³ *Id.* at 19.

comply with the limits and has equipped its system with the means to do so.²⁸⁴ Finally, SkyBridge argues that the Commission provides no guidance on how a licensee would demonstrate compliance with the PFD limit. In the absence of an agreed to methodology for demonstrating compliance, SkyBridge asserts that any showing would be susceptible to considerable dispute.

104. Northpoint opposes SkyBridge's request that PFD limits be applied as "operational limits" rather than "hard limits" because doing so would give free reign to NGSO FSS to cause harmful interference to MVDDS receivers until the MVDDS licensee can prove that NGSO FSS is the source of the problem.²⁸⁵ Northpoint supports the Commission's finding that making PFD limits dependent upon complaints or demonstration of violation would not provide adequate or uniform protection and states that SkyBridge provides no sound reason to reverse the decision.

105. SkyBridge replies that designating limits as "operational" is a recognized tool in instances where the likelihood of a system exceeding the limits is low and demonstrating compliance introduces artificial constraints.²⁸⁶ SkyBridge clarifies that designating limits as "operational" will not require MVDDS entities to "prove" that an NGSO FSS system is exceeding the limits. The NGSO FSS bears the burden to demonstrate compliance with respect to a particular MVDDS receiver in response to a credible claim of interference. SkyBridge argues that this is how other PFD limits in Section 25.208 of the Commission's rules are enforced in that FSS operators are not required to demonstrate in advance that the limits will not be exceeded.²⁸⁷

106. *Decision.* Upon review of the *Second R&O*, we find that clarification of our low angle PFD compliance requirement of Section 25.208(k) is appropriate. We agree with SkyBridge that the adopted requirement does not necessarily apply in all cases. We believe that it would be better to treat the adopted low angle PFD in a manner consistent with the rules for NGSO FSS and BSS sharing where validation (*i.e.*, "hard limit") and operational (*i.e.*, can be exceeded so long as they are not exceeded into an operational receiver) EPFD limits were adopted.²⁸⁸ The PFD hard limit that NGSO FSS can never exceed is specified in Article 21 of the Radio Regulations.²⁸⁹ The limit we adopted in the *Second R&O*, is an operational limit which means that it does not need to be met in all cases so long as it is not exceeded into an operational MVDDS receiver. Thus, the NGSO FSS system needs to be designed so that it can adjust its power to meet the operational limit to protect MVDDS in the worst case circumstance.

107. We disagree, however, with SkyBridge's argument that demonstrating compliance with operational limits is necessary only upon a credible claim of harmful interference into identified operational MVDDS receivers. As the Commission recently stated, in rejecting a similar argument from SkyBridge regarding NGSO FSS/BSS sharing, demonstration of compliance prior to operation provides assurance to the Commission and other operators that the system will be built to operate in accordance with the PFD limits.²⁹⁰ Therefore, we will require NGSO FSS licensees to demonstrate prior to operation, as SkyBridge suggests, that their system is capable of meeting the adopted limits. Licensees should

²⁸⁴ *Id.* at 20.

²⁸⁵ Northpoint consolidated response at 19.

²⁸⁶ SkyBridge reply at 4.

²⁸⁷ *See* 47 C.F.R. § 25.208.

²⁸⁸ *See* Third Memorandum Opinion and Order, ET Docket No. 98-206, FCC 03-25 (rel. Feb. 6, 2003) at ¶¶ 19-22 (*Third MO&O*).

²⁸⁹ In Region 2, the limit for the 12.2-12.7 GHz band is -148 dBW/m²/4 kHz at angles between 0 and 5 degrees above the horizon. *See* ITU Radio Regulations, Article 21.

²⁹⁰ *See Third MO&O* at ¶ 26.

provide any information they deem necessary to meet this showing. As the Commission recently stated regarding NGSO FSS/BSS sharing, the demonstration can rely on anticipated or actual operational parameters.²⁹¹ As SkyBridge further suggests, if an MVDDS station experiences interference, we will require NGSO FSS operators to expeditiously either demonstrate, using its actual operating parameters, that it is not violating the limits into that receiver, or take steps to reduce its PFD into that receiver. If it cannot do so, the alternative is that its system must remain within the operational limit at all times.²⁹²

108. The PFD limits were codified in Section 25.208 of our rules, however, the Commission neglected to codify the demonstration requirement in Section 25.146 as discussed in the text of the *Second Report and Order*.²⁹³ Therefore, we are modifying Sections 25.146 and 25.208 to clarify the points discussed above.

3. MVDDS and NGSO FSS Information Sharing

109. *Positions of the Parties.* In its petition, SkyBridge states that Section 25.139 of the rules requiring information exchange is not sufficiently clear regarding the amount and timing of the information that should be given to an MVDDS operator.²⁹⁴ Because subscriber information could be proprietary, SkyBridge requests that the Commission clarify that the information not be construed as public information and that NGSO FSS operators may require MVDDS operators to execute an appropriate non-disclosure agreement prior to releasing any data. Further, it asserts that NGSO FSS operators should not be required to disclose more information than is required to meet Section 25.139(b) (*i.e.*, sufficient information for the MVDDS licensee to determine whether a new transmitter will meet the separation requirement). Finally, SkyBridge requests that MVDDS operators be prohibited from using the information for any purposes other than the technical coordination required by the Commission.

110. Northpoint does not oppose SkyBridge's request to clarify the information exchange needed to meet the separation requirement.²⁹⁵ Northpoint contends that a bare minimum of information needed would be the latitude, longitude (within 100 feet) and frequency of NGSO FSS receivers.²⁹⁶ Provided that such information is readily available, Northpoint does not object to nondisclosure agreements and limiting the use of the information only to compliance with the separation requirements.

111. *Decision.* We find that the concerns of SkyBridge regarding our required information exchange for coordination between MVDDS and NGSO FSS operations have merit.²⁹⁷ Because certain NGSO FSS subscriber information could be considered proprietary information (*e.g.*, for competitive reasons), we clarify that the information exchange requirement should be construed narrowly and that only information necessary to achieve the required separation under Section 25.139(b) (*i.e.*, "sufficient information from the database to enable the MVDDS licensee to determine whether the proposed MVDDS transmitting site meets the minimum spacing requirement") needs to be provided. The information provided should include, as a minimum, the NGSO FSS latitude, longitude (within 30.5 m

²⁹¹ *Id.*

²⁹² *Id.* at ¶ 27

²⁹³ *Second R&O* at ¶ 121.

²⁹⁴ SkyBridge Petition at 20.

²⁹⁵ Northpoint Response at 20.

²⁹⁶ *Id.*

²⁹⁷ SkyBridge Petition at 20. Specifically, our rules required that the NGSO FSS licensee maintain a database of its deployed receivers that can be readily shared with MVDDS licensees for the purpose of determining compliance with the MVDDS transmitter spacing requirements.

(100 ft)) and frequency of operation.²⁹⁸ We also find that the MVDDS operators shall be prohibited from using this information for any purposes other than for the technical coordination required by our Rules. Further, the NGSO FSS database information should be made readily accessible to the designers of the MVDDS system so that restrictions can be considered in the design of the system. Therefore, we are modifying Section 25.139(a). We believe that this action is adequate to address SkyBridge's concerns. As far as parties executing non-disclosure agreements, we observe that that parties are free to use such agreements to facilitate the coordination process.

V. PROCEDURAL MATTERS

A. Final Regulatory Flexibility Certification

112. The Final Regulatory Flexibility Certification is contained in Appendix C.

B. Paperwork Reduction Analysis

113. The Fourth Memorandum Opinion and Order contains new or modified information collection(s) subject to the Paperwork Reduction Act of 1995 (PRA) Public Law 104-13. The information will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collections contained in this proceeding.

C. Further Information

114. For further information concerning this Fourth Memorandum Opinion and Order, contact the Office of Engineering and Technology, Gary Thayer, (202) 418-2290, TTY (202) 418-2989, email gthayer@fcc.gov, or Jennifer Burton, (202) 418-7581, TTY (202) 418-2989, email jburton@fcc.gov.

VI. ORDERING CLAUSES

115. Accordingly, IT IS ORDERED that pursuant to Sections 4(i), 302, 303(e) 303(f), 303(g), 303(r) and 405 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(e), 303(f), 303(g) and 405, the petitions for reconsideration filed by Pegasus Broadband Corporation, MDS America, Inc., EchoStar Satellite Corporation and DIRECTV, Inc., SkyBridge L.L.C., SES Americom, Inc., and Satellite Broadcasting and Communications Association ARE DENIED.

116. IT IS FURTHER ORDERED that Parts 25 and 101 of the Commission's Rules ARE AMENDED as specified in Appendix D. Parts 25 and 101 contain information collection requirements which have not been approved by the Office of Management and Budget ("OMB"). The Commission will publish a document in the Federal Register announcing the effective date of these rule parts.. This action is taken pursuant to Sections 4(i), 303(c), 303(f), 303(g) 303(r) and 309(j) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 303(c), 303(f), 303(g), 303(r) and 309(j).

117. IT IS FURTHER ORDERED that the Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Fourth Memorandum Opinion and Order*, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

²⁹⁸ Northpoint Response at 20.

118. IT IS FURTHER ORDERED that the proceeding in ET Docket No. 98-206 IS TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A: Petitions for Reconsideration, Oppositions and Replies**Petitions for Reconsideration**

(Filed June 24, 2002)

Pegasus Broadband Corporation (Pegasus)

MDS America, Inc. (MDS America)

(Filed July 26, 2002)

EchoStar Satellite Corporation and DIRECTV, Inc. - joint petition (EchoStar and DIRECTV)

SkyBridge L.L.C. (SkyBridge)

SES Americom, Inc. (SES Americom)

Satellite Broadcasting and Communications Association (SBCA)

Oppositions to Petitions for Reconsideration

(Filed July 12, 2002)

Satellite Receivers, Ltd. (Satellite Receivers)

(Filed September 3, 2002)

EchoStar Satellite Corporation and DIRECTV, Inc. - joint opposition (EchoStar and DIRECTV)

MDS America, Inc. (MDS America)

(MDS America filed four separate oppositions on this date, one each as to the reconsideration petitions filed by: 1) EchoStar, DIRECTV and SBCA 2) SkyBridge; 3) Pegasus and 4) SES Americom)

Replies and Comments to Petitions to for Reconsideration

(Filed September 3, 2002)

Northpoint Technology, Ltd., and Broadwave USA, Inc. - joint response (Northpoint and Broadwave)

Digital Broadband Applications Corp. (DBAC)

(Filed September 13, 2002)

MDS America, Inc. (MDS America)

(MDS America filed three separate replies on this date, one each as to the oppositions/comments filed by: 1) EchoStar and DIRECTV; 2) Northpoint; and 3) Digital Broadband Applications Corp.)

(Filed September 18, 2002)

EchoStar Satellite Corporation and DIRECTV, Inc. - joint reply (EchoStar and DIRECTV)

SkyBridge L.L.C. (SkyBridge)

SES Americom, Inc. (SES Americom)

Satellite Broadcasting and Communications Association (SBCA)

APPENDIX B: Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR Parts 25 and 101 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, and 332, unless otherwise noted.

2. Section 25.139 is amended by revising paragraph (a) to read as follows.

§ 25.139 NGSO FSS coordination and information sharing between MVDDS licensees in the 12.2 GHz to 12.7 GHz band.

(a) NGSO FSS licensees shall maintain a subscriber database in a format that can be readily shared with MVDDS licensees for the purpose of determining compliance with the MVDDS transmitting antenna spacing requirement relating to qualifying existing NGSO FSS subscriber receivers set forth in §101.129 of this chapter. This information shall not be used for purposes other than set forth in §101.129 of this chapter. Only sufficient information to determine compliance with §101.129 of this chapter is required.

* * * * *

3. Section 25.146 is amended by adding a new paragraph (g) and redesignating paragraphs (g) through (m) as paragraphs (h) through (n) to read as follows.

§ 25.146 Licensing and operating authorization provisions for the non-geostationary satellite orbit fixed-satellite service (NGSO FSS) in the bands 10.7 GHz to 4.5 GHz.

* * * * *

(g) *Operational power flux density, space-to-Earth direction, limits.* Ninety days prior to the initiation of service to the public, the NGSO FSS system licensee shall submit a technical showing for the NGSO FSS system in the band 12.2-12.7 GHz. The technical information shall demonstrate that the NGSO FSS system is capable of meeting the limits as specified in §25.205(o). Licensees may not provide service to the public if they fail to demonstrate that they are capable of complying with the PFD limits.

* * * * *

4. Section 25.208 is amended by amended by revising the first sentence of paragraph (o) to read as follows:

§ 25.208 Power flux density limits.

* * * * *

(o) In the band 12.2-12.7 GHz, for NGSO FSS space stations, the specified low-angle power flux-density at the Earth’s surface produced by emissions from a space station shall not be exceeded into an operational MVDDS receiver: * * *

* * * * *

PART 101 - FIXED MICROWAVE SERVICES

5. The authority citation for Part 101 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303.

6. Section 101.111 is amended by revising the footnote immediately after the definition of “B” in paragraph (a)(2)(i) to read as follows:

§ 101.111 Emission limitations.

* * * * *

(a) * * *

(2) * * *

(i) * * *

MVDDS operations in the 12.2-12.7 GHz bands shall use 24 megahertz for the value of B in the emission mask equation set forth in this section. The emission mask limitation shall only apply at the 12.2--12.7 GHz band edges and does not restrict MVDDS channelization bandwidth within the band.

8. Section 101.1440 is amended by revising paragraph (d) (2) and (e) to read as follows.

§ 101.1440 MVDDS protection of DBS.

* * * * *

(d) * * *

(2) No later than forty-five days after receipt of the MVDDS system information in (d)(1), the DBS licensee(s) shall provide the MVDDS licensee with a list of only those new DBS customer locations that have been installed in the 30-day period following the MVDDS notification and that the DBS licensee believes may receive harmful interference or where the prescribed EPFD limits may be exceeded. In addition, the DBS licensee(s) could indicate agreement with the MVDDS licensee’s technical assessment, or identify DBS customer locations that the MVDDS licensee failed to consider or DBS customer locations where they believe the MVDDS licensee erred in its analysis and could exceed the prescribed EPFD limit.

* * * * *

(e) Beginning thirty days after the DBS licensees are notified of a potential MVDDS site under (d)(1), the DBS licensees are responsible for providing information they deem necessary for those entities who

install all future DBS receive antennas on its system to take into account the presence of MVDDS operations so that these DBS receive antennas can be located in such a way as to avoid the MVDDS signal. These later installed DBS receive antennas shall have no further rights of complaint against the notified MVDDS transmitting antenna(s).

APPENDIX C –Final Regulatory Flexibility Certification

The Regulatory Flexibility Act of 1980, as amended (RFA),²⁹⁹ requires that a regulatory flexibility analysis be prepared for notice-and-comment rule making proceedings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”³⁰⁰ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”³⁰¹ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.³⁰² A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).³⁰³

Under the amended rules adopted in the Fourth Memorandum Opinion and Order, as discussed above, DBS licensees are required to provide the MVDDS licensee with a list of only those new DBS customer locations that have been installed in the 30-day period following the MVDDS notification and that the DBS licensee believes may receive harmful interference or where the prescribed equivalent power flux density (EPFD) limits may be exceeded. This requirement is less burdensome than the rule adopted in the *Second Report and Order*³⁰⁴ that required disclosure of all DBS customer locations under similar circumstances. Furthermore, under the amended rules, DBS licensees are required to provide merely the information deemed necessary by DBS licensees to enable others to take into account the presence of MVDDS transmitters. This requirement is less burdensome than the rule adopted in the *Second Report and Order* that imposed direct responsibility on DBS licensees for proper siting of future DBS receivers to take into account the presence of MVDDS.

Licensees of NGSO FSS systems are required to submit, ninety days prior to the initiation of service to the public, a technical showing that demonstrates that they are capable of meeting low-angle radiation limits specified in §25.205(o) of the Commission's rules for the 12.2-12.7 GHz band. Finally, licensees of NGSO FSS systems are required under the amended rules to ensure that the PFD limit is not exceeded into an operational MVDDS receiver. Taken together, these requirements are less burdensome than those adopted in the *Second Report and Order* because they merely require a showing that the NGSO FSS system is *capable* of meeting (instead of demonstrating the system has factually met) the specified technical limits, and because the PFD limit need only be met into *operational*, rather than *all*, MVDDS receivers.

These changes are deregulatory because they lessen compliance requirements. Therefore, we certify that the requirements of the Fourth Memorandum Opinion and Order will not have a significant economic impact on a substantial number of small entities.

²⁹⁹ The RFA, *see* 5 U.S.C. § 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

³⁰⁰ 5 U.S.C. § 605(b).

³⁰¹ 5 U.S.C. § 601(6).

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

³⁰³ 15 U.S.C. § 632.

³⁰⁴ *Second R&O*, 17 FCC Rcd 9614 (2002).

The Commission will send a copy of the Fourth Memorandum Opinion and Order, including a copy of this Final Regulatory Flexibility Certification, in a report to Congress pursuant to the Congressional Review Act.³⁰⁵ In addition, the Fourth Memorandum Opinion and Order and this final certification will be sent to the Chief Counsel for Advocacy of the SBA, and will be published in the Federal Register.³⁰⁶

³⁰⁵ See 5 U.S.C. § 801(a)(1)(A).

³⁰⁶ See 5 U.S.C. § 605(b).

APPENDIX D – Summary of Numerical Results

Tables 1-5 compare the baseline availability and unavailability (outage) due to rain only with calculated availability and outage due to rain plus MVDDS. These values are shown as a percentage over an average one-year period. For the rain plus MVDDS, we calculate the availability and outage percentages using the adopted regional EPFD values and for comparison purposes using an assumed 10% increase in minutes of unavailability over the baseline. The tables also compare the differences between the availability and unavailability percentages calculated using the regional EPFD values and the baseline. The same differences are also compared for the values calculated using the regional EPFD values and the assumed 10% increase in outage. The tables show that for the CONUS satellites the increase in outage as a percentage over an average year is less than one-tenth of one percent in all cases (except for Honolulu). Similar results are shown for the “wing” satellites.

Table 6 compares the unavailability between the old satellite at 110° West Longitude (the one used to develop the regional EPFD values) and the new spot beam satellite currently operating from that location.³⁰⁷ In all cases, the results show that the potential outages that a DBS customer may experience are less for the new satellite as compared to the old satellite.

³⁰⁷ This new satellite was launched in August 2002. For technical detail of the new satellite see *Application of EchoStar Satellite Corporation for Authority to Launch and Operate EchoStar VIII*, File No. SAT-LOA-20020329-00042; *Application of EchoStar Satellite Corporation for Minor Modification of DBS Authorization, Launch and Operating Authority EchoStar VIII*, SAT-MOD-20020329-00041; and the *Revised Technical Appendix*, SAT-AMD-20020430-00086.

**Table 1: Satellite Located at 101° West Longitude – Comparison of Availability and Unavailability (Outage) Attributable to MVDDS for various criteria
(all values are expressed as a percentage over a year)**

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Miami	99.673	0.327	99.644	0.356	99.640	0.360	0.029	(0.004)	8.876
Orlando	99.718	0.282	99.691	0.309	99.690	0.310	0.028	0.000	9.835
Tampa	99.729	0.271	99.702	0.298	99.701	0.299	0.027	(0.001)	9.811
Atlanta	99.835	0.165	99.819	0.181	99.819	0.181	0.016	0.000	9.931
Phoenix	99.874	0.126	99.859	0.141	99.862	0.138	0.016	0.003	12.351
Houston	99.802	0.198	99.788	0.212	99.782	0.218	0.014	(0.006)	7.023
Seattle	99.859	0.141	99.845	0.155	99.845	0.155	0.014	0.000	9.838
Sacramento	99.854	0.146	99.841	0.159	99.839	0.161	0.014	(0.001)	9.310
San Francisco	99.876	0.124	99.863	0.137	99.863	0.137	0.013	0.001	10.476
Dallas	99.844	0.156	99.833	0.167	99.828	0.172	0.011	(0.004)	7.253
Nashville	99.895	0.105	99.884	0.116	99.884	0.116	0.011	0.000	10.293
Portland	99.891	0.109	99.881	0.119	99.880	0.120	0.011	0.000	9.911
St. Louis	99.908	0.092	99.901	0.099	99.899	0.101	0.007	(0.002)	7.739
Cincinnati	99.911	0.089	99.904	0.096	99.902	0.098	0.007	(0.002)	7.823
Kansas City	99.919	0.081	99.913	0.087	99.911	0.089	0.006	(0.002)	7.786
Cleveland	99.930	0.070	99.923	0.077	99.923	0.077	0.006	(0.001)	8.759
Chicago	99.938	0.062	99.933	0.067	99.932	0.068	0.005	(0.001)	8.106
Milwaukee	99.941	0.059	99.936	0.064	99.935	0.065	0.005	(0.001)	8.159
Detroit	99.942	0.058	99.938	0.062	99.937	0.063	0.005	(0.001)	8.231
Minneapolis	99.942	0.058	99.938	0.062	99.937	0.063	0.005	(0.001)	8.210
Denver	99.972	0.028	99.967	0.033	99.969	0.031	0.004	0.002	15.478
Greenville	99.926	0.074	99.922	0.078	99.919	0.081	0.004	(0.003)	5.444
Philadelphia	99.958	0.042	99.955	0.045	99.954	0.046	0.003	(0.001)	7.724
Charlotte	99.945	0.055	99.942	0.058	99.940	0.060	0.003	(0.002)	5.544

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Washington DC	99.958	0.042	99.956	0.044	99.954	0.046	0.002	(0.002)	5.762
New York	99.962	0.038	99.960	0.040	99.958	0.042	0.002	(0.002)	5.897
Boston	99.969	0.031	99.967	0.033	99.966	0.034	0.002	(0.001)	6.597
Indianapolis	99.911	0.089	99.909	0.091	99.902	0.098	0.002	(0.007)	2.249
Pittsburgh	99.968	0.032	99.966	0.034	99.965	0.035	0.002	(0.001)	5.865
San Diego	99.975	0.025	99.973	0.027	99.972	0.028	0.002	(0.001)	6.364
Columbus	99.961	0.039	99.960	0.040	99.957	0.043	0.001	(0.002)	3.791
Los Angeles	99.984	0.016	99.983	0.017	99.983	0.017	0.001	(0.001)	6.691
Baton Rouge	99.769	0.231	99.747	0.253	99.746	0.254	0.022	(0.001)	9.473
New Orleans	99.759	0.241	99.736	0.264	99.735	0.265	0.023	(0.001)	9.385
Shreveport	99.819	0.181	99.800	0.200	99.801	0.199	0.019	0.001	10.340
Billings	99.978	0.022	99.975	0.025	99.975	0.025	0.003	0.001	12.297
Fargo	99.906	0.094	99.896	0.104	99.896	0.104	0.009	0.000	9.891
Salt Lake City	99.988	0.012	99.986	0.014	99.986	0.014	0.002	0.001	15.420
Omaha	99.931	0.069	99.926	0.074	99.925	0.075	0.005	(0.001)	7.966
Oklahoma City	99.914	0.086	99.907	0.093	99.905	0.095	0.007	(0.002)	7.662
Boise	99.988	0.012	99.986	0.014	99.986	0.014	0.001	0.000	11.674
Jackson	99.802	0.198	99.782	0.218	99.782	0.218	0.020	0.001	10.279
Anchorage*	99.972	0.028	99.971	0.029	99.969	0.031	0.001	(0.002)	3.564
Honolulu**	98.334	1.666	97.946	2.054	98.167	1.833	0.388	0.221	23.270

* Based on 240 CM DBS receive antenna (See www.directv.com/DTVAPP/learn/FAQ_DTVBasics.jsp)

**Based on 90 cm DBS receive antenna

Notes:

1. The absolute value of the difference is the same whether comparing availability or outage (unavailability).
2. Cities shown in gray are additional cities analyzed in *Second Report and Order* to validate results of original 32 city sample.
3. Values shown in brackets indicate better DBS performance with regional EPFD than with an assumed 10% limit on unavailability.

**Table 2: Satellite Located at 110° West Longitude – Comparison of Availability and Unavailability (Outage) Attributable to MVDDS for various criteria
(all values are expressed as a percentage over a year)**

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Philadelphia	99.728	0.272	99.650	0.350	99.701	0.299	0.079	0.051	28.892
Washington DC	99.736	0.264	99.664	0.336	99.709	0.291	0.072	0.045	27.121
New York	99.748	0.252	99.678	0.322	99.723	0.277	0.070	0.045	27.811
Houston	99.529	0.471	99.462	0.538	99.482	0.518	0.068	0.020	14.380
Boston	99.780	0.220	99.714	0.286	99.758	0.242	0.067	0.044	30.241
Nashville	99.714	0.286	99.648	0.352	99.685	0.315	0.066	0.037	23.007
Dallas	99.617	0.383	99.557	0.443	99.578	0.422	0.059	0.021	15.493
Pittsburgh	99.796	0.204	99.739	0.261	99.775	0.225	0.056	0.036	27.482
Columbus	99.767	0.233	99.723	0.277	99.743	0.257	0.044	0.021	18.852
Cincinnati	99.748	0.252	99.705	0.296	99.723	0.277	0.044	0.018	17.402
Cleveland	99.792	0.208	99.752	0.248	99.771	0.229	0.040	0.019	19.260
Kansas City	99.784	0.216	99.747	0.253	99.763	0.237	0.037	0.015	17.146
Miami	99.633	0.367	99.598	0.403	99.596	0.404	0.035	(0.001)	9.673
Detroit	99.829	0.171	99.796	0.204	99.812	0.188	0.033	0.016	19.532
Chicago	99.822	0.178	99.790	0.210	99.804	0.196	0.032	0.014	18.034
Orlando	99.683	0.317	99.651	0.349	99.651	0.349	0.032	0.000	10.057
Milwaukee	99.829	0.171	99.798	0.202	99.812	0.188	0.031	0.014	18.139
Minneapolis	99.838	0.162	99.808	0.192	99.821	0.179	0.029	0.013	18.176
Indianapolis	99.751	0.249	99.722	0.278	99.726	0.274	0.029	0.004	11.807
Tampa	99.696	0.304	99.668	0.332	99.666	0.334	0.029	(0.002)	9.414
St. Louis	99.751	0.249	99.729	0.271	99.726	0.274	0.022	(0.003)	8.963
Atlanta	99.814	0.186	99.794	0.206	99.796	0.204	0.020	0.001	10.830
Greenville	99.829	0.171	99.810	0.190	99.812	0.188	0.019	0.002	11.040
Charlotte	99.868	0.132	99.852	0.148	99.855	0.145	0.017	0.003	12.614

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Phoenix	99.874	0.126	99.858	0.142	99.861	0.139	0.016	0.003	12.560
Seattle	99.869	0.131	99.855	0.145	99.856	0.144	0.014	0.001	11.069
Sacramento	99.863	0.138	99.848	0.152	99.849	0.151	0.014	0.001	10.473
Portland	99.899	0.101	99.888	0.112	99.889	0.111	0.011	0.001	11.100
San Francisco	99.882	0.118	99.871	0.129	99.870	0.130	0.011	(0.001)	9.500
San Diego	99.936	0.064	99.928	0.072	99.930	0.070	0.008	0.002	13.208
Los Angeles	99.959	0.041	99.953	0.047	99.955	0.045	0.006	0.002	13.902
Denver	99.970	0.030	99.966	0.034	99.967	0.033	0.004	0.001	14.527
Baton Rouge	99.752	0.248	99.726	0.274	99.727	0.273	0.025	0.001	10.260
New Orleans	99.740	0.260	99.714	0.286	99.714	0.286	0.026	0.000	10.176
Shreveport	99.805	0.195	99.786	0.214	99.786	0.214	0.019	0.000	9.873
Billings	99.977	0.023	99.975	0.025	99.975	0.025	0.003	0.001	12.532
Fargo	99.893	0.107	99.882	0.118	99.882	0.118	0.011	0.000	10.173
Salt Lake City	99.988	0.012	99.986	0.014	99.987	0.013	0.002	0.001	15.683
Omaha	99.816	0.184	99.781	0.219	99.797	0.203	0.035	0.016	18.740
Oklahoma City	99.775	0.225	99.738	0.262	99.753	0.247	0.037	0.015	16.667
Boise	99.988	0.012	99.987	0.013	99.987	0.013	0.002	0.000	13.149
Jackson	99.785	0.215	99.762	0.238	99.763	0.237	0.023	0.001	10.522
Anchorage*	99.942	0.058	99.937	0.063	99.937	0.063	0.005	(0.001)	8.929
Honolulu**	99.911	0.089	99.909	0.091	99.902	0.098	0.002	(0.007)	2.198

*Based on 180 cm DBS receive Antenna

**Based on 90 cm DBS receive Antenna

Notes:

1. The absolute value of the difference is the same whether comparing availability or outage (unavailability).
2. Cities shown in gray are additional cities analyzed in *Second Report and Order* to validate results of original 32 city sample.
3. Values shown in brackets indicate better DBS performance with regional EPFD than with an assumed 10% limit on unavailability.

**Table 3: Satellite Located at 119° West Longitude – Comparison of Availability and Unavailability (Outage) Attributable to MVDDS for various criteria
(all values are expressed as a percentage over a year)**

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Miami	99.503	0.497	99.449	0.551	99.453	0.547	0.054	0.004	10.905
Orlando	99.571	0.429	99.522	0.478	99.528	0.472	0.050	0.006	11.567
Tampa	99.593	0.407	99.546	0.454	99.552	0.448	0.047	0.006	11.564
Atlanta	99.747	0.253	99.713	0.287	99.721	0.279	0.034	0.008	13.389
Greenville	99.761	0.239	99.731	0.269	99.737	0.263	0.031	0.007	12.825
Philadelphia	99.834	0.166	99.807	0.193	99.817	0.183	0.027	0.010	15.986
Charlotte	99.811	0.189	99.784	0.216	99.792	0.208	0.026	0.007	13.893
New York	99.844	0.156	99.821	0.179	99.828	0.172	0.023	0.007	14.779
Houston	99.738	0.262	99.716	0.284	99.711	0.289	0.022	(0.004)	8.384
Washington DC	99.840	0.160	99.819	0.181	99.824	0.176	0.022	0.006	13.659
Boston	99.861	0.139	99.839	0.161	99.846	0.154	0.021	0.007	15.125
Nashville	99.838	0.162	99.819	0.182	99.822	0.178	0.020	0.004	12.245
Seattle	99.843	0.157	99.823	0.177	99.827	0.173	0.020	0.004	12.516
Indianapolis	99.874	0.126	99.855	0.145	99.862	0.138	0.019	0.007	15.421
Sacramento	99.835	0.165	99.816	0.184	99.819	0.181	0.019	0.003	11.658
Dallas	99.791	0.209	99.773	0.227	99.770	0.230	0.018	(0.003)	8.708
Pittsburgh	99.881	0.120	99.863	0.137	99.869	0.131	0.018	0.006	14.728
San Francisco	99.860	0.140	99.844	0.156	99.846	0.154	0.016	0.002	11.748
Portland	99.879	0.121	99.864	0.136	99.867	0.133	0.015	0.003	12.541
Cincinnati	99.857	0.144	99.843	0.157	99.842	0.158	0.014	(0.001)	9.477
Columbus	99.865	0.135	99.852	0.148	99.852	0.148	0.013	(0.001)	9.651
Cleveland	99.880	0.120	99.868	0.132	99.868	0.132	0.012	0.000	9.718
Los Angeles	99.922	0.078	99.911	0.089	99.914	0.086	0.011	0.004	14.781
Kansas City	99.885	0.115	99.875	0.125	99.874	0.126	0.011	(0.001)	9.329

City	Baseline		Rain plus MVDDS		Rain plus MVDDS		Increase in Outage	Rain plus MVDDS	Increase in Outage
	(Rain Only)		(using regional EPFD)		(assuming 10% limit)		(using regional EPFD)	Difference between Regional EPFD and assumed 10% limit	Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage	Difference Between Rain plus MVDDS and Baseline (rain only)		
San Diego	99.920	0.080	99.911	0.089	99.912	0.088	0.010	0.002	12.186
Detroit	99.903	0.097	99.893	0.107	99.893	0.107	0.010	0.000	9.866
Chicago	99.902	0.098	99.893	0.107	99.893	0.107	0.010	0.000	9.734
Milwaukee	99.907	0.093	99.898	0.102	99.897	0.103	0.009	0.000	9.871
Minneapolis	99.915	0.085	99.906	0.094	99.906	0.094	0.008	0.000	9.848
Phoenix	99.941	0.059	99.936	0.064	99.935	0.065	0.004	(0.002)	7.227
St. Louis	99.864	0.136	99.862	0.138	99.850	0.150	0.002	(0.012)	1.393
Denver	99.987	0.013	99.985	0.015	99.985	0.015	0.001	0.000	8.889
Baton Rouge	99.683	0.317	99.646	0.354	99.652	0.348	0.037	0.006	11.772
New Orleans	99.666	0.334	99.627	0.373	99.632	0.368	0.039	0.006	11.731
Shreveport	99.753	0.247	99.722	0.278	99.728	0.272	0.030	0.006	12.231
Billings	99.969	0.031	99.965	0.035	99.966	0.034	0.004	0.001	14.020
Fargo	99.846	0.154	99.824	0.176	99.830	0.170	0.022	0.007	14.365
Salt Lake City	99.984	0.016	99.981	0.019	99.982	0.018	0.003	0.001	19.199
Omaha	99.903	0.097	99.893	0.107	99.893	0.107	0.009	0.000	9.566
Oklahoma City	99.882	0.118	99.871	0.129	99.870	0.130	0.011	(0.001)	9.185
Boise	99.996	0.004	99.995	0.005	99.995	0.005	0.000	0.000	7.725
Jackson	99.719	0.281	99.685	0.315	99.691	0.309	0.034	0.006	12.195
Anchorage*	99.987	0.013	99.987	0.013	99.986	0.014	0.000	(0.001)	3.720
Honolulu**	99.635	0.365	99.602	0.398	99.599	0.401	0.033	(0.003)	9.072

*Based on 180 cm DBS receive Antenna

**Based on 90 cm DBS receive Antenna

Notes:

1. The absolute value of the difference is the same whether comparing availability or outage (unavailability).
2. Cities shown in gray are additional cities analyzed in *Second Report and Order* to validate results of original 32 city sample.
3. Values shown in brackets indicate better DBS performance with regional EPFD than with an assumed 10% limit on unavailability.

Table 4: Satellite Located at 61.5° West Longitude – Comparison of Availability and Unavailability (Outage) Attributable to MVDDS for various criteria (all values are expressed as a percentage over a year)

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Seattle*	98.282	1.718	98.108	1.892	97.756	2.244	0.525	0.352	30.563
Los Angeles	99.693	0.307	99.662	0.338	99.659	0.341	0.033	0.002	10.869
Miami	99.847	0.153	99.832	0.168	99.840	0.160	0.007	(0.009)	4.447
Kansas City	99.902	0.098	99.893	0.107	99.896	0.104	0.007	(0.003)	6.752
Detroit	99.948	0.052	99.942	0.058	99.944	0.056	0.004	(0.002)	7.048
Washington	99.966	0.034	99.963	0.037	99.965	0.035	0.002	(0.002)	5.030
New York	99.972	0.028	99.969	0.031	99.970	0.030	0.002	(0.001)	5.654

* The availability for this city is less than the desired 99.8%.

Notes:

1. The absolute value of the difference is the same whether comparing availability or outage (unavailability).
2. Values shown in brackets indicate better DBS performance with regional EPFD than with an assumed 10% limit on unavailability.

Table 5: Satellite Located at 148° West Longitude – Comparison of Availability and Unavailability (Outage) Attributable to MVDDS for various criteria (all values are expressed as a percentage over a year)

City	Baseline (Rain Only)		Rain plus MVDDS (using regional EPFD)		Rain plus MVDDS (assuming 10% limit)		Increase in Outage (using regional EPFD) Difference Between Rain plus MVDDS and Baseline (rain only)	Rain plus MVDDS Difference between Regional EPFD and assumed 10% limit	Increase in Outage Over Baseline (using regional EPFD)
	Availability	Outage	Availability	Outage	Availability	Outage			(%)
Seattle*	98.470	1.530	98.145	1.855	98.316	1.684	0.325	0.170	21.216
San Francisco	99.502	0.498	99.374	0.626	99.452	0.548	0.128	0.078	25.763
Portland	99.610	0.391	99.498	0.502	99.570	0.430	0.111	0.072	28.553
Dallas	99.627	0.373	99.599	0.401	99.589	0.411	0.028	(0.009)	7.560
Detroit	99.681	0.319	99.653	0.347	99.649	0.351	0.028	(0.004)	8.709
Los Angeles	99.925	0.075	99.915	0.085	99.917	0.083	0.010	0.002	12.882
Phoenix	99.933	0.067	99.929	0.072	99.926	0.074	0.004	(0.003)	5.926

* The availability for this city is less than the desired 99.8%.

Notes:

1. The absolute value of the difference is the same whether comparing availability or outage (unavailability).
2. Values shown in brackets indicate better DBS performance with regional EPFD than with an assumed 10% limit on unavailability.

Table 6: Comparison of Old and New (Spot Beam) Satellite at 110° West Longitude for Selected Cities

	Baseline Outage (Rain Only)		Rain plus MVDDS Outage (using regional EPFD)		Increase in Outage			
	Minutes		Minutes		Minutes		Percent	
	Old	New	Old	New	Old	New	Old	New
Philadelphia	1429.000	204.040	1842.000	215.323	413.000	11.283	28.901	5.530
Washington DC	1388.300	203.230	1765.000	212.977	376.700	9.747	27.134	4.796
New York	1323.600	58.249	1692.000	59.127	368.400	0.878	27.833	1.507
Boston	1156.800	115.091	1506.500	119.273	349.700	4.182	30.230	3.634
Nashville	1504.400	127.989	1850.100	131.459	345.700	3.470	22.979	2.711
Kansas City	1134.800	90.464	1329.700	92.041	194.900	1.577	17.175	1.743
Oklahoma City*	1182.000	925.122	1379.000	1051.000	197.000	125.878	16.667	13.607
Charlotte	692.100	156.056	779.300	160.409	87.200	4.353	12.599	2.789
Phoenix*	661.900	514.250	744.600	565.918	82.700	51.668	12.494	10.047
Seattle	689.000	233.658	765.300	244.440	76.300	10.782	11.074	4.614
Los Angeles	215.800	172.765	245.600	186.908	29.800	14.143	13.809	8.186
Denver	155.600	33.717	178.100	35.540	22.500	1.823	14.460	5.407

Note: All calculations done using spot beam except those indicated by *. In these cases, a spot beam is not available for this city and the CONUS beam was used.

**SEPARATE STATEMENT OF
COMMISSIONER KEVIN J. MARTIN
APPROVING IN PART AND DISSENTING IN PART**

Re: 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; Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; and Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide a Fixed Service in the 12.2-12.7 GHz Band, Fourth Memorandum Opinion and Order and Order, ET Docket No. 98-206, RM-9147, and RM-9245.

I approve in part and dissent in part for the reasons explained in my earlier separate statement on this matter. *See Separate Statement of Commissioner Kevin J. Martin, Approving in Part and Dissenting in Part, 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; Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; and Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide a Fixed Service in the 12.2-12.7 GHz Band, Memorandum Opinion and Order and Second Report and Order, ET Docket No. 98-206, RM-9147, and RM-9245 (rel. May 23, 2002).*