BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
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;	)	ET Docket No. 98-206 RM-9147 RM-9245
	)	
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	)	
	)	

COMMENTS OF PEGASUS BROADBAND CORPORATION TO MITRE REPORT

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May 15, 2001

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COMMENTS OF PEGASUS BROADBAND CORPORATION TO MITRE REPORT

Pegasus Broadband Corporation ("Pegasus"), by its attorneys, hereby submits these Comments, and accompanying Technical Appendix, to the MITRE Corporation Report, *Analysis of Potential Harmful Interference to DBS from Proposed Terrestrial Services in the 12.2-12.7 GHz Band* (April 23, 2001) ("MITRE Report").[1] Pegasus commends MITRE on its thorough and professional technical analysis of MVDDS interference to DBS services in the Ku band. Pegasus concurs with MITRE's general conclusion that MVDDS can operate in the 12.2-12.7 GHz band without causing harmful interference to incumbent DBS <u>if and only if</u> certain

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[1] *See* Public Notice, DA 01-933 (April 23, 2001).

operating characteristics of the MVDDS system are limited, and proper and suitable mitigation techniques are employed. Specifically, Pegasus urges the Commission to adopt an unavailability criterion of 2.86% for any one MVDDS operator and no more than 10% for all MVDDS operators in a region. To control the level of interference to DBS receivers, the Commission should limit the maximum transmit power for MVDDS transmitters to 12.5 dBm, and require that MVDDS systems be designed so that no existing or future DBS receivers experience a C/I degradation of more than 23 dB due to interference from any MVDDS transmitter. Pegasus also generally supports MITRE's process for licensing and mitigation. Pegasus recommends, however, that the DBS service provider, not the MVDDS operator as MITRE proposes, be responsible for the physical implementation of any mitigation measures directed at DBS receivers.

Background

Pegasus Broadband Corporation. Pegasus is both a Direct Broadcast Satellite ("DBS") service provider and an applicant for Multichannel Video Distribution and Data Service ("MVDDS") in the 12.2-12.7 GHz band.[2] As a result, Pegasus has a unique perspective on the MVDDS technical rules and mitigation techniques appropriate to protect DBS services.

To assist the MITRE analysis, Pegasus participated in several meetings with MITRE to discuss DBS-MVDDS sharing issues and submitted information to MITRE concerning Pegasus' MVDDS system design. In these meetings, Pegasus helped clarify design parameters and identified significant factors influencing sharing potential, including MVDDS tower height, the

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[2] *See* PDC Broadband Corporation, Application for License to Provide New Terrestrial Transport Service in the 12.2-12.7 GHz Band (April 18, 2000).

possibility of better-shielded DBS antennas, and quantitative measurements of metal and building shielding.

In response to the Commission's Further Notice of Proposed Rulemaking in this proceeding,[3] Pegasus proposed technical service rules for MVDDS systems designed to permit a viable terrestrial service while protecting incumbent DBS service.[4] Specifically, Pegasus urged the Commission to adopt explicit operating requirements for MVDDS as a primary method of mitigating interference and encouraged the Commission to adopt a detailed mitigation process in order to provide a foundation to facilitate coordination between MVDDS operators and DBS service providers.

The MITRE Report. Based on inputs from two of the MVDDS applicants, Northpoint and Pegasus, MITRE performed interference simulations and analyses to determine the effectiveness of various MVDDS design parameters and mitigation techniques in reducing interference to DBS receivers. *See* MITRE Report, at 1-1 to 1-4. In its study, MITRE assumes without explanation that a 10% unavailability criterion is the appropriate measure for determining the mitigation zone.[5]

MITRE concludes that MVDDS can operate in the 12.2-12.7 GHz band without causing harmful interference to incumbent DBS <u>if and only if</u> certain operating characteristics of the

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[3] *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*, ET Docket No. 98-206, FCC 00-418 (December 8, 2000) ("*FNPRM*").

[4] Pegasus hereby incorporates by reference its Comments (March 12, 2001) ("Pegasus Comments") and Reply Comments (April 5, 2001) filed in this proceeding.

[5] *See* MITRE Report, at 6-6 ("An increase of 2.86% seems very small and there is precedent for 10% increase as a criterion").

MVDDS system are limited, and proper and suitable mitigation techniques are employed.[6] The MITRE Report identifies two primary methods for controlling interference to DBS service: (i) limiting the operational parameters or system design of MVDDS transmitters; and (ii) implementing corrective measures directed at DBS receivers. *See* MITRE Report, at 6-2 to 6-5. MITRE also proposes a specific licensing and mitigation process through which interference issues would be largely resolved prior to full operation of an MVDDS system. *See* MITRE Report, at 6-5 to 6-6.

Discussion

The MITRE Report confirms much of what is already in the record in this proceeding, including the studies conducted by Northpoint and the DBS industry and the technical

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[6] Specifically, MITRE concludes in its Report that:

- MVDDS sharing of the 12.2-12.7 GHz band currently reserved for DBS poses a significant interference threat to DBS operation in many realistic operational situations.
- However, a wide variety of mitigation techniques exists that, if properly applied under appropriate circumstances, can greatly reduce, or eliminate, the geographical extent of the regions of potential MVDDS interference impact upon DBS.
- MVDDS/DBS bandsharing appears feasible if and only if suitable mitigation measures are applied. Different combinations of measures are likely to prove "best" for different locales and situations.

MITRE Report, at 6-1.

submissions of Pegasus.[7] As a result, there are only a few points in the MITRE Report with which Pegasus finds it necessary to either disagree or clarify.[8]

I. TECHNICAL RULES FOR SHARING AND OPERATIONS IN THE 12.2-12.7 GHZ BAND

A. Unavailability

MITRE recommends the use of a 10% relative increase in unavailability as the measure for determining the mitigation zone.[9] Pegasus, however, supports the Commission's proposed 2.86% increase in unavailability from each MVDDS system and a 10% cumulative limit from multiple MVDDS systems operating in the same area. *See* Pegasus Comments, at 4. Pegasus believes that a 2.86% unavailability criterion is necessary to protect DBS subscribers. *See* Technical Appendix, at 5-7. As illustrated in Figure 5-2 of the MITRE Report, the C/I values corresponding to a 2.86% criterion, 27 to 33 dB, are within the range of acceptable interference values commonly coordinated for FSS and other space and terrestrial systems, both nationally and internationally. The C/I values corresponding to a 2.86% measures are also within the range of 25 dB, the values calculated by the Commission and the DBS industry.[10] A 2.86% measure is

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[7] *See e.g.*, DirecTV and EchoStar, Report of the Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon Hill, MD (July 25, 2000); Technical Supplement, Pegasus Comments (March 12, 2001).

[8] The attached Technical Appendix by Pegasus provides a more detailed and technical analysis of the MITRE Report.

[9] *See* MITRE Report, at 6-6. In making this determination, MITRE explicitly rejects alternative measures of interference. *Id*.

[10] *See generally*, FNPRM, Appendices G and H; DirecTV and EchoStar, Report of the Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon Hill, MD (July 25, 2000).

also consistent with the unavailability criterion that was negotiated and implemented for NGSO FSS and DBS sharing in the 12.2-12.7 GHz band and limits the worst case interference scenario for DBS service providers to a 20% total relative increase in unavailability from both NGSO FSS and MVDDS (10% from NGSO FSS systems and another 10% from MVDDS systems).

B. Maximum Radiation Limitation

MITRE states that "keeping the MVDDS transmitter power as low as possible without sacrificing coverage requirements is often a prerequisite for minimizing interference to DBS." MITRE Report, at 6-2. MITRE does not, however, specifically recommend a maximum radiation limit.[11] Pegasus supports the Commission's proposal to impose a maximum EIRP of 12.5 dBm, a value based on the interference tests conducted by Northpoint and the DBS industry.[12] Greater transmitting power is likely to create large, unmanageable mitigation zones and also cause harmful interference to DBS receivers. *See* Technical Appendix, at 7-8.

C. Maximum Degradation Level

Pegasus proposes that MVDDS operators be prohibited from designing systems where an existing or future DBS receiver would experience a C/I degradation of more than 23 dB from interference from any transmitter.[13] This requirement is necessary because available subscriber-

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[11] MITRE Report, at 6-2. MITRE notes that if the maximum radiation level exceeds an EIRP of 14 dBm, a study of the impact of rain scatter would be necessary. *See* MITRE Report, at 6-5.

[12] *See e.g.*, Northpoint, Progress Report WA2XMY (October 1999); DirecTV and EchoStar, Report of the Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon Hill, MD (July 25, 2000).

[13] *See* Pegasus Comments, at 6. This estimate is based on the assumption that only antennas and external shielding similar in size to existing DBS antennas are acceptable and that these antennas have at least the same communications performance and the same environmental performance in wind, rain, snow and ice. *See* Technical Appendix, at 9-10.

related mitigation measures are modest and limited. *See* Pegasus Comments, at 6. Without such a requirement, it would be necessary to establish more explicit service rules with respect to tower height, vertical beamwidth, vertical sidelobe rolloff, and vertical beam tilt.[14] Pegasus believes that limiting the extent of the required mitigation provides more flexibility to the MVDDS operator in designing the system.

II. MITIGATION PROCESS

MITRE proposes a mitigation process for MVDDS which takes incremental steps to ensure that DBS service is protected both during and after the MVDDS licensing procedure.[15] The proposed process involves computation and careful selection of a mitigation zone, pre-operational mitigation, and a test period with supplemental mitigation. *See* MITRE Report, at 6-5 to 6-6. MITRE's proactive approach, which is similar to the process advocated by Pegasus in this proceeding, intends to preempt the occurrence of unacceptable interference to DBS subscribers. [16]

Pegasus generally supports MITRE's proposed process but suggests that it be modified so that DBS service providers would be directly responsible for the physical implementation of any mitigation measures involving DBS receivers. MVDDS operators would remain financially

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[14] *See* Technical Appendix, at 10.

[15] *See* MITRE Report, 6-5 to 6-6. MITRE states that "future DBS customers should be protected for as long as the MVDDS transmitter operates." Both Pegasus and Northpoint support MITRE's conclusion, which is fully consistent with the allocation of MVDDS as secondary in the spectrum. *See e.g.*, Ex Parte Letter to Magalie Salas from J.C. Rozendaal, Annotated Version of MITRE Technical Report, at xix (April 25, 2001) (Northpoint supports requirement to protect existing and future DBS customers as long as MVDDS transmitter operates).

[16] *See* Pegasus Comments, at 7-14. In making this proposal, MITRE rejects the idea to base mitigation on consumer complaints. *See* MITRE Report, at 6-8.

responsible for such efforts. MITRE implicitly assumes without discussion that the MVDDS operators will perform all mitigation measures, including those directed at DBS receivers. However, as Pegasus has noted in prior filings, only DBS service providers have the proper incentives to perform DBS subscriber-related mitigation in a competent and timely manner. *See* Pegasus, at 10-11.

Conclusion

For the foregoing reasons, Pegasus Broadband Corporation proposes that the Commission adopt technical service rules for MVDDS that are consistent with these and other Comments filed by Pegasus in this proceeding.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Angela Dortch, hereby certify that a true and correct copy of the Comments and Technical Appendix of Pegasus Broadband Corporation to the MITRE Report and was sent by first-class mail, postage prepaid, on May 15, 2001 to the following:

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