DOCKET FILE COPY ORIGINAL

HOWREY SIMON ARNOLD & WHITE **HOWREY** LLP
ATTORNEYS AT LAW

RECEIVED

MAY 23 2001

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

1299 PENNSYLVANIA AVE., NW
WASHINGTON, DC 20004-2402
PHONE 202.783.0800
FAX 202.383.6610
A LIMITED LIABILITY PARTNERSHIP

JAMES W. OLSON
PARTNER
202.383.7246
olsonj@howrey.com

May 23, 2001

VIA HAND DELIVERY

Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-B204
Washington, D.C. 20554

Re: ET Docket No. 98-206

Dear Ms. Salas:

Enclosed for filing are an original and four copies of the *Reply Comments of MDS America, Incorporated on the Mitre Report* in the above-captioned matter.

I have enclosed an additional copy. Please date-stamp this copy and return it in the self-addressed envelope provided. Thank you for your assistance.

Sincerely,

James W. Olson

Enclosures

No. of Copies rec'd 0+4
List A B C D E

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 the12.2-12.7 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	)	

REPLY COMMENTS OF MDS AMERICA, INCORPORATED
ON THE MITRE REPORT

James W. Olson
Gregory F. Intoccia
Howrey Simon Arnold & White LLP
1299 Pennsylvania Ave., NW
Washington, D.C. 20004
(202) 783-0800

Counsel for MDS America, Incorporated

Dated: May 23, 2001

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 the12.2-12.7 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	)	

REPLY COMMENTS OF MDS AMERICA, INCORPORATED ON THE MITRE REPORT

MDS America, Incorporated hereby offers its reply comments on the independent report of the Mitre Corporation ("MITRE"), "Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band" (April 2001) (the "MITRE Report") in response to the Commission's Public Notice.[1]

---

[1] *Public Notice,* "Comments Requested on The MITRE Corporation Report on Technical Analysis of Potential Harmful Interference to DBS from Proposed Terrestrial Services in the 12.2-12.7 GHz Band (ET Docket 98-206)," DA 01-933 (rel. April 23, 2001).

I. INTRODUCTION AND SUMMARY

MDS America can provide a unique perspective regarding the MITRE Report, and to this proceeding generally, because of its status as the United States licensee of MDS International. MDS International has spent 15 years developing its terrestrial wireless broadband technology and has deployed such systems around the world for the past several years. To our knowledge, none of the other commenters has sold or installed an operational MVDDS system.

MDS America believes it is significant that MITRE found that MVDDS/DBS sharing is feasible with proper mitigation techniques because MITRE's testing was done under the worst possible conditions for MVDDS. That is, MITRE's testing essentially was limited to technology provided by Northpoint Technology Ltd., ("Northpoint") a firm that has never deployed a real - world terrestrial broadband wireless system, as far as we know. Further, Northpoint's equipment appears to consist largely, if not totally, of off-the-shelf parts.[2] MDS America believes that testing of a system designed by a firm such as MDS International, which has intensive operational experience, would yield superior results (*i.e.,* no harmful interference). MDS America intends to demonstrate this in the Florida testing it is undertaking pursuant to its Experimental License. Those tests, to be conducted by a well-respected independent engineering firm, LCC International, will add to the body of data already available to the Commission, and allow a more balanced, technology-neutral approach to the rule making.[3]

---

[2] DirecTV, Inc. ("DirecTV") points out that Northpoint apparently claims that its system can share effectively with DBS and that it is only something called "generic" MVDDS that creates an interference threat. Comments of DirecTV, Inc. on the Mitre Report (May 15, 2001) at 6. Northpoint's argument is nonsensical. As DirecTV points out, "The primary MVDDS interference evaluated during MITRE testing was Northpoint system interference." *Id.*

[3] MDS America agrees with DirecTV that "designing service rules around one particular frequency-reuse approach that remains unproven is an activity fraught with danger." *Id.* at 17. DirecTV's comment that MDS

MDS America believes that MITRE did an impressive job of testing the undoubtedly immature technology that was presented to it and of writing an unbiased account of the interference predicted and measured. Using the results of this testing, MITRE outlined a number of possible operational and system-design changes which it believed would alleviate interference issues. As discussed below, MDS America endorses most of these suggestions, the bulk of which have been utilized by MDS International in its systems. In addition, through its experience in the field, MDS International has developed additional mitigation techniques, some of which we describe below. We have reviewed carefully the May 15, 2001 initial comments on the MITRE Report filed in this proceeding and find nothing new in them that changes our view of the MITRE Report or of the ability of MVDDS to share the Ku-band successfully with satellite services.

II. MITIGATION TECHNIQUES

MITRE discusses three categories of mitigation techniques, two of which relate to MVDDS systems, operational parameters and system-design changes, and one to corrective measures at DBS receiver locations. MITRE indicates that "MVDDS/DBS bandsharing appears feasible if and only if suitable mitigation measures are applied."[4] MDS America agrees that mitigation is necessary and the experiences of MDS International show that it is feasible. We discuss specific mitigation techniques below.

America has not demonstrated an MVDDS system capable of protecting DBS service will be addressed by the Florida testing, which DirecTV (and any other interested party) has been invited to observe.

4 MITRE Report at xvii.

A. Operational Changes

Keeping MVDDS transmitter power as low as possible.

As MITRE notes, this "is the most basic and obvious means for controlling interference to DBS."[5] MDS International has implemented this concept through an invention that allows the retransmission of a terrestrial signal at very low power rates for the urban environment where accurate prediction of radio frequency field strength levels is not possible due to multipath issues. MDS America suggests that terrestrial coverage is best achieved by a hybrid system using low power repeater/transposers in urban areas and higher power transmitters in rural areas placed on higher towers.

7-MHz frequency offset

MDS International has used frequency offset very effectively in its systems and this continues to be one of its chief mitigation factors. However, MDS International has found that the most effective offset from the carrier varies with the width of the transport stream and therefore may not necessarily be 7-MHz.

Increasing the MVDDS transmitting antenna height

MDS America also agrees with the use of higher antennas for transmission in rural areas, using higher power transmitters. A minimum of 100 meters transmitter height serves to drastically reduce the mitigation zone surrounding the MVDDS transmitter.

Adjusting the elevation tilt

Because MDS systems, in many cases, use a omni-directional antenna, this mitigation technique generally is not used nor it is appropriate for MDS systems. Directionality can be used in certain cases to increase coverage or bandwidth available, but MDS America agrees with MITRE that even then this is not a particularly effective mitigation technique.

Pointing the MVDDS transmitting antenna away from the satellites

---

5 *Id.*

As pointed out on numerous occasions by MDS America, the orientation on a horizontal plane is NOT as significant as some other mitigation techniques. However, to the extent this technique is used, it has been MDS International's experience that a perpendicularly oriented transmit antenna (in relation to the horizontal plane) results in the greatest protection for DBS receive equipment. A judgment as to which orientation offers the best protection depends on the topography of a particular site.

MITRE has suggested that more testing is necessary for determination of the optimum direction for broadcast by a directional antenna. MDS America will incorporate into our Florida testing a plan that allows us to present to the Commission findings in this regard.

MDS America totally agrees with the MITRE Report finding that a generally northern pointing orientation of the MVDDS directional receive antennas (and its obvious corollary of southern pointing transmit antennas), known as the "Northpoint epiphany," IS NOT, in fact, a mitigation technique of any value. As MDS America pointed out in its comments on the *Further Notice of Proposed Rule Making*, "the only working systems of this type of which we are aware do not use this configuration."[6] The MITRE Report is substantiation of MDS America's views on this subject. It is worthy of note that Northpoint, after naming the entire company "Northpoint Technology," seems to have "seen the light" and now repudiates its own name, even claiming that its "patents cover the geometry MITRE describes."[7]

B. Additional MDS International Operational Mitigation Techniques

RF Field Prediction Software

MDS International systems have used successfully other operational mitigation techniques beyond those described by MITRE. One of the most effective of these is the area

---

6 Comments of MDS America, Incorporated to *Further Notice of Proposed Rule Making*, ET Docket No. 98-206 (March 12, 2001).

7 Comments of Northpoint Technology, Ltd. And Broadwave USA, Inc. on Mitre Corporation Report (May 15, 2001) at 8.

survey and coverage prediction done by MDS International prior to the deployment of systems. This is done through the use of a field simulation program that inputs detailed high quality satellite topographical maps to very accurately predict the shape and strength of the radio frequency field ("RF"). This detailed coverage allows MDS International to design each individual system to coexist within its topographical and RF environment.

Useful RF field prediction software is of paramount important in designing a system. In fact, most of the MITRE testing was not field based but used simulation software. This simulation is, in fact, RF field prediction software. In doing the testing of the Northpoint equipment, MITRE was performing the first steps for deployment of a system.

Convolution change

Another method used by MDS International for mitigation is to change the signal convolution of the terrestrial QPSK signal. For instance, in the United States, where we understand that DirecTV and EchoStar use a 3/4 convolution, a terrestrial provider using the same bandwidth could change its convolution to 7/8, thus providing an estimated 5dB protection gain.

Other more proprietary mitigation factors are used by MDS America's licensor to increase the gain and will be used in the Florida testing to provide protection for DBS signals.

C. Design Changes Proposed by MITRE

MITRE specifies a number of potential design changes to the MVDDS system it tested which it believes offer potential benefits. MDS America agrees with several, but not all of these design change suggestions, and has some additional suggestions of its own, as discussed below.

Real time power control

Controlling the output power of the MVDDS transmitter is noted by MITRE as a change which has "sometimes been proposed" for controlling mitigation during periods of reduced reception of DBS due to rain.[8] However, this technique would result in a dynamic propagation

---

8 MITRE Report at xviii.

pattern for the MVDDS systems and would create other problems. It would result in dramatically smaller MVDDS cell coverage and result in more cells being needed to cover any geographical area, thereby increasing the number of mitigation zones and total mitigation area.

A better approach would be "real-time attenuation control" in the receiver of both the DBS and MVDDS systems. Such attenuation control has been developed by MDS International. For the DBS system, this would allow for more signal to be directed into the DBS directional receiver or LNB without over-modulating the set-top box. As rain fade increased, the attenuation would decrease, allowing the LNB to continue to provide enough signal strength to the set-top box. The advantage of this approach would be to allow the DBS customer to enjoy reception of the DBS signal (and decrease the outage time *in toto* of the DBS system) while not affecting the size of the MVDDS cell during rain times.

Using multiple MVDDS transmitting antenna – beams

The idea of narrower azimuthal horns has been used by MDS International in the past to increase the amount of bandwidth available in a given geographic region, based on the allocation of RF bandwidth. This suggestion is part of site engineering and should be evaluated on a case-by-case basis. However, the MDS International omni-directional antenna is in most cases better performing and more appropriate for this use.

Using circularly polarized MVDDS transmission antennas

It has been the experience of MDS International that an aggregate protection gain increase has been achieved by using opposite polarization to the existing DBS polarization scheme (*i.e.*, linear polarization of both vertical and horizontal type when the DBS signal is circularly polarized and vice-versa.) Based on MDS International's experience, this results in an aggregate protection gain of not less than 18dB.

Larger MVDDS receive antennas

While larger MVDDS receive antennas, perhaps like those proposed by ThinKom[9], could result in decreased MVDDS output power, using site engineering and locating higher power systems, using correctly designed MVDDS antennas, outside of urban areas, could provide the same effect, while maintaining the advantage of allowing MVDDS antennas to remain as non-intrusive as possible.

Transmit Antenna Design

MITRE does not mention this, but one of the most important factors in MVDDS/DBS bandsharing is the design of the transmit antenna. MDS International has designed a transmission antenna specifically for MVDDS operations and to reduce the possibility of interference to DBS. This antenna is essentially an omni-directional horn antenna with a reflective shaping that contours the RF field in the immediate area of the transmitter (mitigation zone).

Several other mitigation techniques are available to MVDDS operators, which were not found by MITRE, but have been used by MDS systems in different areas. These mitigation techniques will be reflected in our test results from the MDS America Florida site.

D. DBS Customer Site Mitigation Techniques

The comments of the DBS operators generally decry the DBS customer site mitigation techniques suggested by MITRE. While we understand their concern about their customers, the DBS operators have failed to take into account the advantages these mitigation techniques might have for their existing customers *at no cost* to the DBS operator. In many cases, DBS customers may be receiving non-satisfactory viewing (losing signal everytime it rains) due to poorly installed antennas, etc. MVDDS mitigation at the customer site would correct these installations at no cost to the DBS operator and improve the satisfaction of the DBS customer.

---

9 Comments of ThinKom Solutions, Inc. (May 15, 2001).

III. CONCLUSION

The MITRE Report makes two things clear. First, MVDDS/DBS bandsharing is feasible, even based on testing limited to the immature Northpoint technology. While we understand the concerns of the DBS operators as expressed in their comments, MDS America believes that when its system is tested in Florida, it will become clear that MVDDS systems can co-exist with DBS without harmful interference.

Second, the MITRE Report makes it clear that the solution to the sharing issues it identifies would be advanced if the engineering resources of the various parties were dedicated to working cooperatively to solve the issues identified by MITRE, rather than to supporting the arguments of their lawyers. MDS America would like to further that cooperation. To that end, MDS America is taking two immediate, concrete steps. First, we have invited ThinKom to provide the flat-plane antennas it describes in its comments to MDS America for incorporation in our testing. We have no idea whether ThinKom's technology works as claimed, but if it does, it might be of significant value in reducing interference issues. Second, we have previously invited all interested parties to Florida to see our testing. We repeat that invitation and add to it an invitation to comment on our detailed test plans, which will be provided to the Commission a week before our testing commences. To the extent that any party has practical suggestions to improve our test design, we will incorporate those suggestions into our program. MDS America is willing to take this approach because we have faith, based on real world experience abroad, that the MDS technology will be shown to have the ability to successfully share spectrum with DBS and NGSO providers.

We urge this cooperative approach on the other parties to this contentious proceeding. The public interest benefits that would accrue if this spectrum could be successfully shared among three services are so large that we believe it incumbent on the parties to cooperate fully with the Commission's attempt to resolve the issues necessary to make it happen. MDS America sees at least two large classes of benefits that might result. First, an entirely new service, MVDDS, would be made available to offer multichannel video programming and high-speed

Internet access to imperfectly competitive markets. MVDDS technology may be particularly applicable to rural and under-served markets. Many of MDS International's systems are deployed in just such markets. Second, a precedent might be set for spectrum sharing. The ability to have two or more services co-exist on the same spectrum band will be increasingly important as the scarcity of spectrum grows. The MITRE Report makes it clear that these important public interest goals are reachable. MDS America pledges that it will work toward achieving these goals and urges the same on all other parties.

Respectfully submitted,

MDS America, Incorporated

James W. Olson
Gregory F. Intoccia
Howrey & Simon Arnold & White LLP
1299 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 783-0800

Dated: May 23, 2001

CERTIFICATE OF SERVICE

I hereby certify that on this 23rd day of May, 2001, a true and correct copy of the foregoing was served by hand delivery *and/or First Class United States mail, postage prepaid, upon the following:

*Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Donald Abelson, Bureau Chief
*Thomas Tycz
*Jennifer Gilsenan
*Christopher Murphy
International Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Bruce Franca, Acting Chief
*Rebecca Dorch
*Julius Knapp
*James Burtle
*Michael J. Marcus
*Ira Kelz
Office of Engineering and Technology
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Thomas J. Sugrue, Bureau Chief
*Kathleen O'Brien Hamm, Deputy Chief
*D'wana Terry
*Jamison Prime
Wireless Telecommunications Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Mark Schneider
Office of Commissioner Susan Ness
Commissioner
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Adam Krinsky
Office of Commissioner Gloria Tristani
Commissioner
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Katie King
Office of Commissioner
Harold W. Furchtgott-Roth
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

*Peter A. Tenhula
Office of Chairman Michael Powell
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Gary M. Epstein
James H. Barker
Latham & Watkins
1001 Pennsylvania Ave., NW, Suite 1300
Washington, D.C. 20004-2505

Bruce D. Jacobs
David C. Oxenford
Shaw Pittman
2300 N Street, N.W.
Washington, D.C. 20004-2505

Margaret L. Tobey
Morrison & Foerster, LLP
200 Pennsylvania Avenue, N.W.
Suite 5500
Washington, D.C. 20006

Antoinette Cook Bush
Northpoint Technology, Ltd.
400 North Capitol Street, N.W,
Suite 368
Washington, D.C. 20001

Pantelis Michalopoulos, Esq.
Rhonda M. Bolton
Steptoe & Johnson, L.L.P.
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036

Nathaniel J. Hardy
Irwin, Campbell & Tannenwald, P.C.
1730 Rhode Island Avenue, N.W.
Suite 200
Washington, D. C. 20036-3101

Michael K. Kellogg
Kellogg, Huber, Hansen, Todd & Evans,
P.L.L.C.
1615 M Street, N.W.
Suite 400
Washington, D.C. 20036

Sylvia Coates