Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 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	)	

JOINT PETITION OF ECHOSTAR SATELLITE CORPORATION AND DIRECTV, INC. FOR RECONSIDERATION OF SECOND REPORT AND ORDER

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SUMMARY

The Commission should reconsider in part its *Second Report and Order* issued in these proceedings on May 23, 2002. The Commission's technical rules for Multichannel Video Distribution and Data Service ("MVDDS") established in the *Second Report and Order* are unlawful and arbitrary because they fail to protect Direct Broadcast Satellite ("DBS") providers and their growing national customer base from harmful interference by MVDDS broadcasters. Moreover, the Commission erred by placing much of the burden of mitigation on DBS carriers and their subscribers, rather than on the MVDDS provider whose operations will be the cause of the harmful interference that requires mitigation. In these and other critical respects, the rules fall far short of Congress's explicit direction that this Commission *ensure* that the new service (MVDDS) will not cause "harmful interference" to the existing service upon which millions of television consumers rely. They also eviscerate the primary status of the DBS service and disregards the "no interference" condition attaching to terrestrial use of this spectrum under the Commission's own rules. In the process, the Commission has essentially ignored MITRE's warning of a threat of "significant interference" to DBS service as well as most of the mitigation methods described by MITRE in its report.

Most critically, the decision violates the statutory prohibition against causing harmful interference to DBS subscribers in at least five respects. *First*, there is no doubt that new DBS subscribers are not protected from harmful interference, since the MVDDS provider has no obligation to protect them, even if they are located within the predictive contours where the MVDDS power limit is expected to be exceeded. Indeed, the decision turns harmful interference protection on its head by explicitly making DBS service to these subscribers secondary to MVDDS: the rules provide that "the DBS licensees have the responsibility of ensuring that all

future installed DBS receive antennas on its system are located in such a way as to avoid the MVDDS signal."

Second, the decision does not effectively protect existing DBS subscribers from harmful interference if they are located outside the predictive contour but in fact are subject to higher power from MVDDS than the model predicts. In that regard, the record does not contain any assurance as to the statistical accuracy of the predictive model that the Commission has developed.

Third, DBS subscribers are not protected from harmful interference because, despite the qualifications added to the Order after its adoption, the only criterion of harmful interference reasonably decipherable from the Commission's decision is the 10 percent increase in unavailability that is described by the Commission as a "starting point." The regional EPFD limits do not meet this criterion even "approximately." Indeed, the limit is exceeded for one or more satellite locations in 31 of 32 cities studied, and is exceeded by as much as 200 percent in some locations.

Fourth, the decision does not protect from harmful interference DBS subscribers receiving service from the 61.5°, 148° and 157° orbital locations as well as other orbital slots that may be used to provide DBS services in the future. Specifically, the Commission did *not* take these slots into account in developing the limits and applied the model to those slots only selectively and in an after-the-fact attempt at justification.

Fifth, the Commission did not even specify a direction in which the new service would have to transmit, even though this was Northpoint's much trumpeted method for avoiding interference into DBS and making sharing possible in the first place.

In short, the Commission took an unavailability increase limit that was too high to begin with, downgraded the limit from a ceiling to a rough "starting point," developed EPDF values that exceed the limit in many if not most cases, developed a predictive model that may well underpredict affected DBS subscribers, and left to the mercy of MVDDS all new DBS subscribers (even within the predictive contours), affected subscribers outside the contours, and subscribers receiving service from wing satellite locations. These cumulative layers of error take the Order far afield from the statutory safeguards and the Commission's own rules regarding the protection of the primary DBS service from harmful interference.

To reiterate what they have said before, EchoStar and DIRECTV oppose these rules, not out of fear of competition (which they welcome), but out of a desire to keep millions of DBS customers free from harmful interference. Any company seeking to implement an MVDDS-type service can seek to execute its business plan by using the spectrum allocated today to terrestrial pont-to-multipoint services, such as the Local Multipoint Distribution Service and Multi-Channel Multipoint Distribution Service bands. Indeed, that latter spectrum may be a particularly promising alternative given recent developments in the telecommunications industry. Furthermore, the Commission can still act to make the sparsely used CARS band a suitable home for MVDDS-type services. In that respect, the Commission has recently indicated that it will take another look at the possibility of using the CARS band for ubiquitous consumer services, noting that this proposal raises "valid issues."

In short, the Commission should modify the *Second Report and Order* to provide effective and meaningful protection for DBS providers and customers against harmful interference from MVDDS or, if that proves to be infeasible, it should rescind the authorization for MVDDS to operate in the 12 GHz band.

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To: The Commission

JOINT PETITION
OF ECHOSTAR SATELLITE CORPORATION AND DIRECTV, INC.
FOR RECONSIDERATION OF SECOND REPORT AND ORDER

Pursuant to Rule 1.429 of the Commission's Rules, 47 C.F.R. § 1.429, EchoStar Satellite Corporation ("EchoStar") and DIRECTV, Inc. ("DIRECTV") hereby jointly petition the Commission for reconsideration of its *Second Report and Order* in the above-captioned case, which established technical rules for the implementation of a terrestrial fixed Multichannel Video Distribution and Data Service ("MVDDS").[1] As set forth below, the Commission's

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[1] *See* Memorandum Opinion and Order and Second Report and Order, released on May 23, 2002 (hereafter "*Second Report and Order*"). In this opinion, the Commission also denied reconsideration of its *First Report and Order* in this proceeding. *See* First Report and Order and Further Notice of Proposed Rulemaking, released Dec. 8, 2000 (hereafter "*First Report and Order*"). Because the *Memorandum Opinion and Order* is a final order that has already been subject to reconsideration, EchoStar and DIRECTV filed petitions for review of that order and

technical rules for MVDDS are arbitrary and capricious, unsupported by substantial evidence and contrary to law because they fail to protect Direct Broadcast Satellite ("DBS") providers and their growing national customer base (currently more than 17 million customers combined) from harmful interference by MVDDS operators. Moreover, the rules unlawfully and arbitrarily place much of the burden of mitigation on DBS carriers and their subscribers, rather than on the MVDDS providers whose operations will be the cause of the harmful interference that requires mitigation. In these and other critical respects, the rules fall far short of Congress's explicit direction that the Commission *ensure* that the new service (MVDDS) will not cause harmful interference to the existing service upon which millions of subscription television consumers rely. The decision also eviscerates the primary status of the DBS service and disregards the "no interference" condition attaching to any terrestrial use of this spectrum.

I. The MVDDS Technical Rules Must Be Modified Because They Fail to Provide DBS Carriers and Their Customers With Meaningful Protection

A. The Rules Are Contrary to Law Because They Rely on a Flawed Model That Does Not Protect DBS Service From Harmful Interference

The *Second Report and Order* acknowledges that DBS providers and customers are entitled to be protected against harmful interference from the proposed MVDDS service. *E.g.*, *id.*, ¶ 54. In fact, Congress has made it clear not once, but twice, that the Commission has an obligation to *guarantee* that no such harmful interference occurs. In 1999, Congress enacted the Rural Local Broadcast Signal Act ("RLBSA"), which was intended to encourage the Commission to authorize use of existing commercial spectrum to provide local broadcast television service to unserved and underserved areas, but which expressly provided that "[t]he Commission shall *ensure that no facility licensed or authorized . . . causes harmful interference*

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the underlying *First Report and Order* with the D.C. Circuit on July 18 and 19, 2002 (Docket Nos. 02-1235 & 02-1234). This petition is thus directed at the *Second Report and Order*.

to the primary users of that spectrum."[2] The legislative history confirms that Congress' clear intent was to protect primary users of the spectrum to the maximum extent from the risk of harmful interference:

> The FCC shall ensure that no license or authorization provided under this section will cause "harmful interference" to the primary users of the spectrum or to public safety use . . . . The Commission typically categorizes a licensed service as primary or secondary. Under Commission rules, a secondary service cannot be authorized to operate in the same band as a primary user of that band unless the proposed secondary user *conclusively demonstrates* that the proposed secondary use will not cause harmful interference to the primary service.

Joint Explanatory Statement of the Comm. of Conference on H.R. 1554, 106th Cong., (Nov. 9, 1999) (emphasis added).

To give this requirement teeth, Congress subsequently enacted a statutory provision entitled "Prevention of Interference to Direct Broadcast Satellite Services." Pub. L. No. 106-553, § 1012(b), 114 Stat. 2762, 2762A-344 (2000). There, Congress required "[a]n independent technical demonstration of any terrestrial service technology . . . 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." *Id.* The clear implication of this provision is that no terrestrial service can be licensed in the 12 GHz band unless the Commission can *ensure* that it will not cause harmful interference to DBS carriers and their customers.

This conclusion is reinforced by the Commission's own regulations, which clearly provide that DBS is entitled to protection from interference in the 12 GHz band. For example, the Commission's "Frequency Assignment" regulation states:

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[2] Act of Nov. 29, 1999, Pub. L. No. 106-113, Div B, § 2000(b)(2), 113 Stat. 1501 (Nov. 29, 1999) ("RLBSA") (emphasis added).

> 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 noninterference basis and are required to make *any and all* adjustments necessary to prevent interference to operating domestic broadcasting-satellite systems.

47 C.F.R. § 101.147(p) (emphasis added). Similarly, in the footnotes to the Table of Frequency Allocations, 47 C.F.R. § 2.106, the Commission's regulations provide that the 12.2 - 12.7 GHz band is "allocated to the fixed-satellite service (space-to-Earth) on a primary basis." 47 C.F.R. § 2.106 n. S5.487A. The footnotes further state: "[I]n the band 12.2 - 12.7 GHz, existing *and future* terrestrial radiocommunications services shall not cause harmful interference to the space services operating in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix S30." *Id.* n. S5.490 (emphasis added).

Under these rules, MVDDS -- no matter how it is characterized -- does not have a higher status than that traditionally accorded secondary services under longstanding Commission regulations. 47 C.F.R. § 2.105(c)(2). That is, MVDDS must not cause harmful interference to DBS and cannot claim any protection against harmful interference from DBS operations. Indeed, when Northpoint originally applied to initiate MVDDS, it expressly asserted that the proposed service would be on a "secondary, non-interfering basis to DBS services and on a co-primary basis with any new FSS."[3] Regardless of the terminology used, therefore, the bottom line is that the Commission erred in ascribing to MVDDS a higher status than secondary.

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[3] *First Report and Order*, 16 FCC Rcd 4096, 4194 ¶ 263. The *Second Report and Order*, by contrast, characterizes MVDDS as "co-primary" but subject to a no-harmful-interference standard. *Second Report and Order*, ¶ 87. EchoStar and DIRECTV agree with and adopt the SBCA's argument that this "co-primary" characterization is flawed. *See* Petition for Reconsideration of the Satellite Broadcasting and Communications Association, at 3-10 (filed July 26, 2002). In addition, they do not believe the Commission gave adequate notice of the potential change in status of the proposed service. But even if this is an accurate characterization of the status of MVDDS, it does not change the fact that DBS is entitled by statute and regulation to absolute protection from harmful interference by MVDDS providers.

MVDDS must give way in the face of a conflict because DBS is the primary assigned use of the 12 GHz spectrum and has been given specific protection against harmful interference from fixed terrestrial operations.

In the face of these clear and explicit rules, the *Second Report and Order* not only fails to guarantee that DBS carriers and their customers will be protected from harmful interference by MVDDS, but in fact it leaves them with no meaningful protection at all. The rules as adopted are so permissive, vague and subject to exceptions that they virtually ensure that many DBS customers will suffer harmful interference for which they can obtain no effective remedy. This is a far cry from the regime of protection for DBS that the Commission established in its frequency assignment regulations and that Congress mandated in the RLBSA.

This fundamental flaw is most evident in the predictive model the Commission used to establish the regional limits on equivalent power flux-density ("EPFD") for MVDDS operations. Rather than place a firm limit on the amount of increased unavailability DBS customers could experience from MVDDS operations, the Commission's model depends on an alleged 10 percent "starting point." As Commissioner Martin has pointed out, this "starting point" approach is completely inadequate in light of the clear congressional guidance that the Commission must *ensure* DBS service against harmful interference from MVDDS.[4] Indeed, while the *Second Report and Order* offers repeated assurances that the presence of MVDDS service will not cause harmful interference,[5] it never defines what *would* constitute harmful interference in this context,

[4] Statement of Commissioner Kevin J. Martin (dissenting in part and approving in part) ("Martin Statement") at 1.

[5] Martin Statement, at 6-7.

and sets no effective limit on the amount of increased unavailability of DBS service that may be experienced at particular locations.[6]

EchoStar and DIRECTV 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 on the increased availability from any specific competing provider.[7] However, even if the Commission has concluded that an additional 10 percent increase in unavailability attributable to MVDDS is permissible, the 10 percent "starting point" adopted in the *Second Report and Order* is clearly not a meaningful standard. Among the many shortcomings of this supposed standard are the following:

- Even under the Commission's flawed model, the supposed 10 percent standard is exceeded in 31 of the 32 markets considered in the model with respect to one or more full-CONUS satellite locations (see *Second Report and Order*, App. G.);

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[6] *See Motor Vehicle Mfrs. Ass'n v. State Farm*, 463 U.S. 29, 48 (1983) (agency acts arbitrarily when it has "entirely failed to consider an important aspect of the problem"). Of course, the Commission's regulations define "harmful interference" in general as interference that "seriously degrades, obstructs, or repeatedly interrupts" another service. 47 C.F.R. § 2.1. By the Commission's own admission, MVDDS will cause "repeated interruption" to DBS in the form of increased outages associated with periodic weather events. The Commission has failed, however, to articulate any standard for determining when such interruptions rise to the level of "harmful interference."

[7] *E.g.*, Comments of EchoStar Satellite Corporation at 10-17 (Mar. 12, 2001). These limits are based on the conclusions of the International Telecommunications Union ("ITU") regarding NGSO FSS, and reflect years of careful study and evaluation by that international body. They are also similar to the limits the Commission itself appeared to be considering in its further notice of proposed rulemaking. *See First Report and Order*, ¶¶ 268-69. Although the Commission now contends that the NGSO FSS limits were not intended to apply to MVDDS or other fixed terrestrial services directly, *Second Report and Order*, ¶¶ 41-42, the order fails to explain why the underlying rationale of the NGSO FSS limits does not apply equally in the case of MVDDS. In particular, the conclusion of the ITU was that a 10 percent increase in unavailability is the most that DBS carriers and their customers should be expected to bear from another service. *See* First Order and Report, at ¶16. The Commission fails entirely to justify why a much higher standard should apply in the case of MVDDS.

- The median increase in those 32 markets is more than 10 percent and the mean increase is almost 12 percent, which contradicts the very notion of a 10 percent standard (*id.*, ¶ 84.);

- The increases in unavailability predicted by the Commission's model range as high as 20-30 percent in many markets, and would likely be even higher if the model included a more comprehensive dataset (*id.*, App. G; *see also* Martin Statement at 9); and

- The model fails to consider at all increases in unavailability from satellites at "wing" locations (*e.g.*, 61.5° and 148° West Longitude) in computing the allowable EPFD levels.[8]

While EchoStar and DIRECTV do not take issue, in general, with the use of EPFD limits as a tool for constraining the impact of MVDDS interference on DBS service,[9] the Commission's proposed EPFD limits are simply not adequate. As discussed in the attached Verified Statement by EchoStar executive Edmund F. Petruzzelli, the Commission's model must be modified in a number of respects to make it even minimally acceptable as a means of setting a firm limit on harmful interference to DBS service.[10] First, and most importantly, if the Commission concludes that 10 percent increased unavailability is the applicable standard (recognizing that EchoStar and DIRECTV believe the threshold should be significantly lower, *i.e.*, 2.86 percent), the model must be calibrated so that it actually yields a *ceiling* of 10 percent increased unavailability. This

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[8] The Commission did perform a set of "sample" calculations involving the wing satellites at 61.5° and 148° West Longitude. Those "sample" calculations are even less comprehensive than the Commission's primary 32-city study, however, and even the Commission does not contend that its sample is representative. In any event, even for this limited sample, the increased outages range as high as 30.6 percent for the 61.5° West Longitude satellite and 28.5 percent for the 148° West Longitude satellite. *Second Report and Order*, App. G. No analysis was made at all of the slots at 157°, 166°, and 175°.

[9] *See, e.g.*, Ex Parte Letter from Gary M. Epstein, *et al.*, to Magalie Roman Salas, ET Docket No. 98-206, *et al.* (filed Jan. 31, 2002).

[10] The information in this Verified Statement is properly presented on reconsideration because it responds directly to the Commission's computer model, which was unveiled for the first time in the *Second Report and Order*. *See* 47 C.F.R. § 1.429(b).

means that, for each city and each applicable satellite location, the EPFD limit should be established such that the model will predict no more than a 10 percent increase in unavailability of DBS service. The "double average" approach used in the Commission's model -- in which multiple satellite locations are averaged for each city, and then multiple cities are averaged for each region -- must be eliminated, since this approach by definition fails to provide a meaningful limit on increased unavailability (and hence harmful interference) for any particular group of customers in a particular geographic location. This "double average" approach in fact goes beyond anything requested by the proponents of MVDDS. In addition, the model must consider not only the full-CONUS locations, but also the existing wing satellites, which currently provide important programming for hundreds of thousands of EchoStar subscribers.[11] The model should also contain input data for each of the specific sub-markets for which the Commission intends to issue separate MVDDS licenses.

Nor does the Commission's action effectively protect existing DBS subscribers from harmful interference if they are located outside the predictive contour but in fact are subject to higher power from MVDDS than the model predicts. In that regard, the record does not contain any assurance as to the statistical accuracy of the predictive model that the Commission has developed. In view of the "no interference" obligation of MVDDS, the assumptions of this predictive model should have erred on the side of caution to avoid the risk of underpredicting affected DBS subscribers. There is no indication however, that the Commission consistently

[11] Among other things, EchoStar's wing satellites at 61.5° and 148° West Longitude transmit dozens of channels of foreign language programming, high definition television, and local broadcast stations in a number of cities. *See* Verified Statement of Edmund F. Petruzzelli, at ¶ 9-10 ("Petruzzelli Statement"). Hundreds of thousands of EchoStar customers have obtained second satellite dish installations in order to receive some or all of this wing satellite programming. Disregarding the interests of these customers in receiving continued service without harmful interference is directly contrary to the congressional directive in the RLBSA.

adhered to any such criterion. Indeed, the prediction methodology was developed outside the APA notice-and-comment process, and is described elliptically even in the Order itself. *See* Petruzzelli Statement, at ¶ 21.

B. The Technical Rules Are Arbitrary and Capricious and Otherwise Unsupported Because the Commission Has Failed to Explain and Justify Them

In addition to the evident flaws in the Commission's computer models, the technical sharing rules adopted in the *Second Report and Order* are arbitrary, capricious and unsupported by substantial evidence because the Commission has not adequately explained or justified its adoption of rules that do not meaningfully protect DBS providers and customers. For example, the Commission all but disregards its prior decisions concluding that sharing between two ubiquitous consumer services -- one satellite and one terrestrial -- is not feasible. In establishing Local Multipoint Distribution Service ("LMDS"), for example, the Commission determined that "co-frequency sharing between either GSO/FSS or NGSO/FSS ubiquitously deployed terminals and LMDS with its ubiquitously deployed subscriber terminals, is not feasible at this time."[12] The Commission reached the same determination when it decided to relocate the digital electronic message service ("DEMS") from the 18 GHz band.[13] The Commission also rejected the idea of co-frequency sharing in the 39 GHz band, noting that there is "wide support for the

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[12] *In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, First Report and Order and Fourth Notice of Proposed Rulemaking, 11 FCC Rcd. 19005, ¶ 27 (1996) ("*LMDS Order*").

[13] *In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earh Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.2-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, Report and Order, IB Docket No. 98-172, ¶ 17 (rel. June 22, 2000).

premise that the types of fixed and satellite services likely to be offered in spectrum above 36 GHz will not be able to share the same spectrum blocks."[14]

In response, the *Second Report and Order* reiterates the statement from the *First Report and Order* that "the increasing demand for spectrum access necessitates that [the Commission] consider more complicated and creative sharing arrangements."[15] It also argues that "the extensive analytic record derived from the MITRE Report as well as the experimental MVDDS test operations in this 12 GHz band . . . support the Commission's conclusion that sharing is feasible in the 12 GHz band." *Second Report and Order*, ¶ 36. It concludes, therefore, that authorizing MVDDS in the 12 GHz band "is consistent with [the] continuing effort to find the highest and most efficient use of spectrum that is supported by the record in a given proceeding." *Id.* However, the Commission nowhere explains why sharing of frequency between ubiquitous satellite and terrestrial services is more feasible in the 12 GHz band than in other frequency bands previously addressed. Nor does it demonstrate how the supposed limits on harmful interference actually adopted in the rules are consistent with the conclusion that such sharing is feasible. Where, as here, the Commission departs from a long line of precedent on a particular point, it has an obligation to do more than simply state that this is a different frequency band. It

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[14] *In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz,* Report and Order and Second Notice of Proposed Rulemaking, 12 FCC Rcd. 18600, ¶ 8 (1997); *see also In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands*, Memorandum Opinion and Order, 14 FCC Rcd. 12428, ¶49 (1999).

[15] *Second Report and Order*, ¶ 35, citing *First Report and Order*, ¶ 224.

must explain what factors support the view that the prior conclusion should not apply here.[16] The Commission has failed to do so.

The Commission's reliance on the MITRE Report is similarly misplaced. Far from supporting the Commission's conclusions, the MITRE Report expressly warned 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," and that band sharing "appears feasible *if and only if* suitable mitigation measures are applied."[17] The MITRE Report also acknowledged that it was an open question whether, even with mitigation measures, "residual MVDDS-to-DBS interference . . . might remain after applying such measures" that could, together with the costs of such mitigation, "outweigh the benefits that would accrue from allowing MVDDS to coexist with DBS in this band."[18] The Commission's conclusion that its technical rules will eliminate any possibility of harmful interference to DBS service is thus unsupported by the MITRE Report's findings.

Moreover, the MITRE Report devastatingly undermines the central premise of the original Northpoint concept for MVDDS service, namely that interference can be reduced or avoided by locating the terrestrial transmit towers in the north, allowing the "generally southerly

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[16] *See AT&T v. FCC,* 236 F.3d 729, 737-38 (D.C. Cir. 2001) ("[I]t is not reasonable for the Commission to announce such a [new] policy without providing a satisfactory explanation for embarking on this course when it has not followed such a policy in the past."); *Committee for Community Access v. FCC*, 737 F.2d 74, 77 (D.C. Cir. 1984) (FCC "cannot silently depart from previous policies or ignore precedent"); *Greater Boston Television Corp v. FCC*, 444 F.2d 841, 852 (D.C. Cir. 1970), *cert. denied*, 403 U.S. 923 (1971).

[17] "MITRE Technical Report: Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band," MITRE Corporation, April 2001 ("MITRE Report"), at xvi and 6-1 (emphasis added).

[18] *Id.*

orientation of domestic DBS dishes to avoid interference with conventional DBS services."[19] MITRE found that the use of towers located in the north *aggravates* interference into DBS (in some cases more, in some cases less). Specifically, the MITRE report observed:

> *Pointing the MVDDS transmitting antennas **away from** the satellites*, rather than toward them as generally envisioned, could have beneficial effects in many situations. . . . When the satellites are generally to the south and their elevation angle is reasonably high . . . dramatic improvements in interference protection appear possible when the MVDDS transmitting antenna points north. When satellite elevation angles are somewhat lower . . . the geometry is somewhat less favorable, but north-pointing seems to yield significant benefits in all locales where it has been simulated.[20]

Far from resolving this crucial issue in its technical rules, the Commission has chosen to compound the problem *by failing to specify any directional orientation at all for the new MVDDS service*. "We find that it is better to allow the MVDDS provider to design its own system," the Commission concluded, "than to promulgate rules limiting design options." *Second Report and Order*, ¶ 202. The apparent rationale for this conclusion is that, "based upon the findings of the MITRE Report, we believe that the direction of MVDDS antennas is not important." *Id.* Given that the central premise of MVDDS service from its earliest origins was that antenna direction was the key to avoiding interference with DBS service, this sudden revelation that antenna direction is "not important" should, at a minimum, have led the Commission to re-think whether this entire exercise is misguided (including reconsidering whether another frequency band, such as MMDS or CARS would be more appropriate for this

[19] Northpoint Petition for Rulemaking (filed Mar. 6, 1998) at 4.

[20] MITRE Report at xviii, 6-2 (emphasis in original).

new service).[21] Equally important, the MITRE Report, on which the Commission relies for this conclusion, does not support the view that direction is unimportant. What MITRE found was that the original concept of south-pointing transmitters and north-facing receivers actually causes *more harmful interference* in many situations than transmitters and receivers facing in the opposite direction.[22] This in no way suggests that direction is "not important," but simply that the Commission has failed to address whether and how in practice MVDDS transmitters can be oriented to avoid harmful interference to DBS service.

The *Second Report and Order* also fails to explain adequately how the regional EPFD limits adopted in the rules will prevent impermissible harmful interference to DBS service. As noted above, the MITRE Report found, after extensive testing, that a significant threat of harmful interference exists.[23] Although the MITRE Report suggested that it might be possible to *reduce* the impact of this harmful interference through various mitigation measures, it did not state that the threat of harmful interference could be *eliminated* even with mitigation. Moreover, neither the MITRE Report nor the *Second Report and Order* provides a detailed explanation of how the suggested mitigation measures (either individually or collectively) would operate to ensure (as required by RLBSA) that no harmful interference will occur.

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[21] As EchoStar and DIRECTV have repeatedly pointed out, neither Northpoint nor the Commission has offered any persuasive rationale for why the proposed MVDDS service cannot be offered in another frequency band (such as the adjacent CARS or MMDS bands) where harmful interference to an existing, ubiquitously deployed consumer service would not be implicated. *E.g.*, EchoStar Satellite Corporation's Petition for Reconsideration, at 20-22 (Mar. 19, 2001). Indeed, perplexingly, the Commission dismissed any consideration of that question in this proceeding, *Second Report and Order*, ¶ 48, only two days after finding in another proceeding that EchoStar's and DIRECTV's proposals regarding the CARS band "raise valid issues." *Amendment of Eligibility Requirements in Part 78 Regarding 12 GHz Cable Television Relay Service*, FCC No. 02-149, CS Docket 99-250, RM-9257, ¶ 44 (May 21, 2002).

[22] MITRE Report at xviii.

[23] *Id.* at xvi.

As EchoStar has previously pointed out, many of the mitigation measures suggested by MITRE and listed in the *Second Report and Order* are either impractical or unlikely to be effective in all situations. The Commission notes, for example, that "DBS receive antennas can be installed such that they will be protected by 'natural' shielding from, for example, buildings or topographical features." *Second Report and Order*, ¶ 87. However, recent data regarding new EchoStar installations indicates that for as many as 10 percent of residential locations, there is only one dish site from which an adequate DBS signal can be received. Petruzzelli Statement, at ¶ 16. For many other locations, the choice of possible dish sites is quite limited, and may not include any positions from which "natural shielding" against MVDDS interference would be available.[24] Finally, the whole concept of "natural shielding" has not been adequately tested in the field and may be rendered entirely ineffective due to multi-path interference. Thus, while there could be limited circumstances in which choosing a particular location for a new DBS dish would minimize MVDDS interference, the Commission has not developed anything approaching a sufficient record to support the conclusion that DBS antenna site mitigation is a panacea for MVDDS interference.

Similar concerns apply to other suggested mitigation measures. The use of "modest additional shielding on the DBS receive antenna (*i.e.*, clip on shields)"[25] raises a host of aesthetic and practical issues as discussed in the Petruzzelli Statement, at ¶ 18. The Commission also suggests the use of "larger or better performing DBS receive antennas" as one of the "reasonable measures to consider." *Second Report and Order*, ¶ 87. However, smaller, lighter satellite

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[24] Indeed, this problem is likely to be all the more significant if the MVDDS transmitters are sited to face northward in order to avoid the "backlobe" interference that MITRE found to be a serious concern. *See* MITRE Report, at 6-3.

[25] *Second Report and Order*, ¶ 87.

receive antennas have been a critical factor in the acceptance of DBS service by consumers. Moreover, the difficulties of installation are compounded significantly with substantially larger dishes, which must be designed to withstand much stronger wind forces. Petruzzelli Statement, at ¶ 18. The Commission also does not explain what it means by "better performing DBS receive antennas," but if the implication is that DBS providers must design (and re-install) an entire new generation of antennas in order to overcome MVDDS interference, then DBS truly has been made secondary to MVDDS, contrary to both RLBSA and applicable Commission regulations.

The lack of connection between the Commission's entirely speculative findings on harmful interference and conditions in the real world is heightened by the Commission's uncritical reliance on a highly theoretical computer model that has never been tested in the field.[26] The Commission repeatedly suggests that, so long as MVDDS transmitting power is less than the prescribed ceiling and the EPFD values calculated by the Commission's model are below the prescribed regulatory limits, then DBS customers should not suffer a perceptible amount of increased unavailability. *E.g., Second Report and Order*, ¶ 85. The Commission has not tested this premise in any serious way, however. At a minimum, this means the Commission should re-visit its determination to engage in an immediate national licensing auction, and instead should consider test-licensing one or two demonstration markets in the first instance so that the harmful interference potential of MVDDS can be evaluated under real world conditions.

[26] The fact that the Commission's model was presented for the first time, without prior notice and opportunity for comment, in the *Second Report and Order* underlines the speculative nature of the Commission's heavy reliance on these theoretical calculations. This model not only has not been tested in the real world, but it has not even been tested within the constrained limits of the notice-and-comment rulemaking process. *See National Mining Ass'n v. Mine Safety & Health Admin.*, 116 F.3d 520, 531 (D.C. Cir. 1997) (policies underlying the notice requirement demand that affected parties be afforded "fair notice" and "an opportunity to develop evidence in the record" before agency adopts final rule).

Otherwise, if the Commission's theoretical model proves to contain unforeseen flaws, this rulemaking may lead to a "national trainwreck" with far-reaching consequences for millions of consumers, DBS and MVDDS investors, and the public interest.

Another area in which the *Second Report and Order* fails to justify its key assumptions is the Commission's conclusion that DBS consumers will not perceive (or perhaps will not place any weight on) increases in DBS unavailability of 10 percent (or even greater). The Commission repeats this assertion numerous times, but offers no concrete support for it. *See e.g., Second Report and Order*, ¶¶ 79, 85. At most, the Commission appears to rely on the notion that, because there is significant natural variation in availability rates between different locations in the country (based primarily on rainfall rates), then further changes that do not exceed those natural variations must not be either perceptible or important to consumers. *Id.* The vast majority of consumers are unaware of regional variations in service availability, however. They are only familiar with the outages that affect *their* service, and they may be acutely aware of increases in unavailability, particularly if such increases occur at critical times (during the Super Bowl or the Academy Awards, for example). *See* Petruzzelli Statement, at ¶ 14. Indeed, the major DBS providers have invested hundreds of millions of dollars in technology to ensure an extraordinarily high level of service availability (on average 99.8 percent or better) precisely because they perceive that service availability is important to their customers' satisfaction (and to keeping those customers from switching back to cable). Petruzzelli Statement, at ¶ 13. The Commission's underlying premise that customers will neither notice nor care about increases in unavailability exceeding 10 percent is thus contrary to the judgment of the marketplace (as well as basic common sense), and is not based on *any* record evidence.

If the Commission's permissive interference limits were to be implemented, the DBS carriers could be forced, contrary to all precedent and their primary status, to use up valuable (and limited) spectrum in order to preserve the reliability of service their customers have come to expect. The primary means by which this could be accomplished would be to increase the effective power levels going to the customers' receivers. However, given the current severe capacity constraints on the spectrum available to DBS carriers, such an increase in effective power levels would require a reduction in the number of channels that can be carried. *Id.* at ¶ 15. Such a reduction in channel capacity has a real and substantial economic cost that would cause significant economic harm to DBS providers. Given the substantial reliance interests of DBS providers on the terms under which their licenses were originally awarded, they 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.[27] The Commission's failure to take account of this scenario in designing the technical sharing rules is a further indication that those rules should be reconsidered and the EPFD limits should be modified so as to provide adequate protection for DBS service.

In possible recognition of the many flaws in the technical rules the Commission has established to protect DBS against MVDDS interference, the Commission has adopted a "safety

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[27] *See United Nuclear Corp. v. United States*, 912 F.2d 1432 (Fed. Cir. 1990) (loss of investment resulting from the Government's cancellation of a permit constitutes a deprivation of property for which just compensation must be paid); *NRG Co. v. United States*, 24 Cl.Ct. 51 (1991) (cancellation of mineral prospecting permits on Indian lands constituted taking). EchoStar and DIRECTV possess reasonable investment-backed expectations in their licenses that cannot now be swept aside by the Commission. *See United Nuclear Corp.*, 912 F.2d at 1463 ("[T]he fact that United agreed that the leases would be subject to future regulation does not indicate that United fairly can be said to have anticipated that the Secretary would apply a new policy requiring tribal approval of mining plans to leases entered into almost six years earlier, in reliance on which United had expended some $5 million."); *see also Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1005 (1984).

valve" procedure under which DBS providers can challenge the EPFD limits at particular locations. This "safety valve" mechanism is itself deeply flawed, however. First, as clear precedent establishes, the mere existence of a "safety valve" cannot save a rulemaking scheme that is otherwise arbitrary and capricious since the "safety valve" would then expand to overshadow the rule itself.[28] Second, the "safety valve" adopted here is too vague and uncertain to provide any meaningful increase in protection for DBS providers and customers. In particular, the standard suggested in the order -- that the DBS provider must show "a tangible detrimental impact on DBS caused by MVDDS operations"[29] -- is completely undefined and appears to be without precedent. DBS providers thus have no way of knowing what kind of showing would be required to adjust the EPFD limits for a particular locale. Moreover, since the EPFD limits are supposed to apply to limit the *design* of a new MVDDS transmitter, it is completely unclear how the DBS complainant is supposed to show a *tangible* detrimental impact *caused by MVDDS operations*. This standard appears to place the cart before the horse. In any event, the Commission's "safety valve" only applies in quite limited situations (*e.g.*, in "anomalous situations" involving the regional EPFD limits), and does nothing to address the range of situations in which the Commission's rules provide inadequate protection for DBS subscribers from MVDDS interference.

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[28] *See Alltel Corp. v. FCC*, 838 F.2d 551, 561 (D.C. Cir. 1988) (likening the Commission's argument that a rule can be saved by an escape hatch provision to a rule that denied all brown-haired people broadcasting licenses but "softened" the impact by limiting the rule to brown-haired people born in odd-numbered years).

[29] *Second Report and Order*, ¶ 83.

II. The Commission's Mitigation Rules Effectively Make DBS Service Secondary To MVDDS and Are Otherwise Contrary to Law, Arbitrary and Capricious and Unsupported by Substantial Evidence

The mitigation rules improperly deny protection to DBS providers and customers in a variety of circumstances, contrary to the protected status of DBS relative to MVDDS. For example, new DBS customers (*i.e.*, those who begin receiving DBS service more than 30 days after the MVDDS provider issues its transmitter site notice) receive *no protection at all* under the mitigation rules. However, as discussed above, the mitigation measures the Commission has suggested for new customers are, for the most part, either impractical or ineffective. Thus, many new customers will be at high risk of either receiving no DBS service at all, or a highly degraded service, which is completely contrary to the protected status of DBS service within the 12 GHz band.[30]

Even existing customers (*i.e.*, "customers of record") do not receive adequate protection under the mitigation rules. First, DBS providers have only 45 days from the date of receipt of an MVDDS operator's transmitter siting notice to determine whether the EPFD contours have been correctly calculated and whether the EPFD limits are exceeded at *any* of what may be hundreds of thousands of DBS customer locations within the "footprint" of the MVDDS transmitter. If the DBS provider inadvertently fails to list a DBS customer for which the EPFD limit is exceeded, that customer's only recourse is to file a complaint against the MVDDS provider. However, in virtually all cases, the DBS customer will not have the technical knowledge to determine

[30] Even if DBS is viewed as merely a "co-primary" service in the 12 GHz band, it is plainly entitled to protection against harmful interference under the applicable footnote, which the Commission does not dispute. *Second Report and Order*, ¶ 54. Moreover, the Commission cannot seriously contend that such protection only applies to customers who were already receiving service when the MVDDS service began operating. The protection is for the service of DBS broadcasting, not for particular individuals who were receiving service on a particular date. Martin Statement at 12 & n.753.

whether the EPFD limit is met at his or her residence. Instead, the first indication of trouble will be an increase in unavailability of DBS service. Unless the customer detects this increase and associates it with the MVDDS transmitter within one year of the initiation of MVDDS service, however, the customer has no recourse whatsoever and must thereafter endure whatever harmful interference occurs. Moreover, once the MVDDS transmitter is installed and operating, existing DBS customers are "locked in" to their current satellite dish location (particularly if the MVDDS provider determined that it could meet the EPFD limits due to "natural shielding" of the existing DBS antenna). If a customer needs to move his or her dish to improve reception (for example, because a tree has grown to the point of blocking the DBS signal) or due to a home remodeling project, the customer is completely at risk that the new dish location will be affected by harmful interference. This regime cannot be reconciled with the statutory and regulatory requirement that DBS service be protected from harmful interference by MVDDS.

The procedures by which DBS customers are supposed to be protected are also grossly inadequate. First, the Commission has not established a standard for field measurements of EPFD values so that DBS carriers and customers can readily establish whether those limits have been exceeded at particular locations. Petruzzelli Statement, at ¶ 20. This omission greatly complicates the task of responding to the MVDDS operator's transmitter siting notice, as well as determining whether subsequent DBS customer complaints (within the one-year statute of limitations) are warranted.

Second, the Commission has not explained how the MVDDS provider is to conduct the "survey" that is required prior to issuing notice of the location and configuration of its transmitter. *Second Report and Order*, ¶ 91. The MVDDS provider is obligated under the rules to demonstrate in its notice that the EPFD limit is not exceeded at any customer location within

the contours of the proposed transmitter. *Id.*, ¶ 89. However, the rules make no provision for the MVDDS provider to obtain a list of all DBS customers within that contour area, and the DBS providers would strenuously resist any such requirement, which would invade the privacy of their customers and expose the DBS carriers to unacceptable risk that the MVDDS provider would improperly use the customer information for competitive purposes. *See id.*, ¶ 28 ("[B]ecause MVDDS and DBS would be competitors, we are mindful of the desire of the DBS licensees to limit an MVDDS operator's ability to access their customers."). Thus, the MVDDS provider is directed to conduct a "survey" of the area, which may suggest that a "sampling" of sites is permissible, rather than a comprehensive list. If so, this is yet another respect in which the Commission has failed to provide complete protection to all existing DBS customers. Alternatively, the MVDDS provider may have to send its employees or agents from door-to-door throughout the entire service area seeking information about DBS customers, which would be a highly cumbersome, uncertain, and invasive process, comparable to the kinds of interviews conducted by the U.S. Census (and facing similar challenges).[31]

Equally problematic is the suggestion that the MVDDS provider can seek "waivers" from existing DBS customers to exceed the EPFD limits at their sites (perhaps as part of the "survey" process). *See Second Report and Order*, ¶ 90. The problem here is that, if DBS customers are fairly and properly informed that they have no obligation to grant a waiver and that the alternative is for the MVDDS provider either to re-locate its transmitter or cease operating, there is little likelihood that a "waiver" would be granted. Only if the MVDDS provider improperly suggests to DBS customers that their service is "secondary" and must accept MVDDS

[31] *See Barry Edmonston,* Using U.S. Census Data to Study Population Composition, *77* North Dakota L. Rev. 711, 719-31 (2001); Benjamin J. Razi, Comment, *Census Politics Revisited: What to Do When the Government Can't Count?*, 48 Am. U. L. Rev. 1101 (1999).

interference is there any likelihood that the MVDDS provider will be successful in persuading DBS customers to "waive" their rights. This is therefore an invitation to mischief, if not outright misrepresentation.

EchoStar and DIRECTV are also strongly opposed to the provision under which DBS providers must provide their MVDDS competitors with a list of all new DBS installations that occur within 30 days of the MVDDS providers' transmitter siting notice. As noted above, information on customer service locations is highly proprietary and competitively sensitive. Such information is never willingly shared with competing MVPD service providers because of the obvious potential for such providers to use the information to attempt to lure those DBS subscribers over to a competing MVDP platform. *See* Petruzzelli Statement, at ¶ 22. The requirement to turn over such information to a direct competitor is both unprecedented and contrary to the protection ordinarily afforded to competitively sensitive confidential data.[32]

Finally, the Commission has completely failed to address the question of how disputes regarding the degree of harmful interference at particular locations are to be resolved. Under the process established in the mitigation rules, the MVDDS provider files its notice specifying how it has complied with the EPFD limits 90 days before it begins operations. The DBS providers must respond within 45 days with information on locations that were missed in the MVDDS provider's survey or that were not properly considered in the EPFD model. The Commission's order seems to assume that any remaining disputes will be resolved within the remaining 45 days

[32] The courts have repeatedly prohibited agencies from requiring the disclosure of confidential information that would cause substantial harm to a party's competitive position. *McDonnell Douglas Corp. v. NASA*, 180 F.3d 303, 306 (D.C. Cir. 1999); *Miami Herald Pub. Co. v. United States*, 670 F.2d 610, 614 (5th Cir. 1982); *National Parks & Conversation Ass'n v. Kleppe*, 547 F.2d 673, 683 (D.C. Cir. 1976); *National Parks & Conservation Ass'n v. Rogers*, 498 F.2d 765, 770 (D.C. Cir. 1974). The forced disclosure of confidential information reinforces the takings problems that arise from this ruling. *Cf. Ruckelshaus v. Monsanto Co.*, 467 U.S. 986 (1984) (forced disclosure of trade secrets constituted a taking requiring just compensation).

before MVDDS operations begin, but it does not say how that is to happen or what will occur if disputes remain outstanding at the end of the 90-day period. Given the high probability that the MVDDS provider and the DBS providers will not agree on whether the appropriate standards have been met at all locations, the Commission needs to specify in concrete terms how disputes will be resolved, lest the MVDDS providers proceed on the assumption that they can commence operations at the end of 90 days regardless of whether the EPFD limits have, in fact, been met at all existing customer locations.

III. The Order Is Procedurally Infirm Because of the Manner in Which It Was Adopted

Apart from its substantive defects, the *Second Report and Order* was adopted in a manner which violates the requirements of the Administrative Procedure Act and the Government in the Sunshine Act. *See* 5 U.S.C. §552b. As is evident from Commissioner Martin's statement, the order as presented to the Commissioners at the open meeting held on April 11, 2002, differed in a number of highly material respects from the order as eventually issued on May 23, 2002.[33] The whole point of the Sunshine Act is that the Commissioners must do their business in open session where the public (and each of the individual Commissioners) can be aware of what is being proposed and adopted.[34] While matters can also be decided by circulation, an order

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[33] For example, the majority apparently amended the draft order to delete the statement that "all DBS customers, regardless of which satellite(s) they are using, are entitled to interference protection." Martin Statement at 1. The majority also substantially weakened at least eight references to a 10 percent limit on increased DBS unavailability relative to the baseline, substituting instead the concept of 10 percent as a "starting point" for increased unavailability. *Id.* & n.710. In effect, as Commissioner Martin describes, the majority resolved the conflict between its draft order and the accompanying computer model not by adjusting the computer model to match the principles in the draft order, but by adjusting the principles in the order to fit the model. *Id.* at 6-7.

[34] *See Clark-Cowlitz Joint Operating Agency v. FERC*, 798 F.2d 499, 501 (D.C. Cir. 1986) (declared policy of the Sunshine Act is that "the public is entitled to the fullest practicable information regarding the decisionmaking process of the Federal Government"); *Common Cause*

adopted in a sunshine meeting cannot be substantially altered by circulation (other than for routine editorial changes). In this case, however, the Commission held its public discussion on an entirely different version of the order than the one eventually released to the public. This process not only deviates unacceptably from the norms established in the Sunshine Act, but it also further highlights the lack of notice to affected parties, as well as the lack of consideration and adequate explanation that infects this order. This is therefore an additional ground supporting a thorough re-examination of the *Second Report and Order.*

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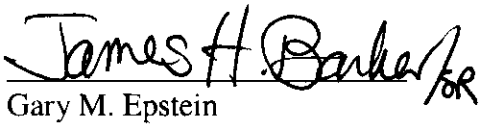
v. Nuclear Regulatory Comm'n, 674 F.2d 921, 928 (D.C. Cir. 1982) (in enacting the Sunshine Act, Congress "sought to make government more fully accountable to the people.").

CONCLUSION

EchoStar and DIRECTV respectfully request that the Commission reconsider its *Second Report and Order* and modify it to provide effective and meaningful protection for DBS providers and customers against harmful interference from MVDDS or, if that proves to be infeasible, that it rescind the authorization for MVDDS to operate in the 12 GHz band.

Respectfully submitted,



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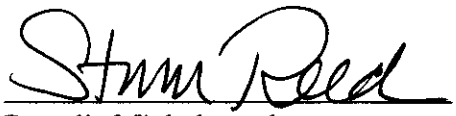

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July 26, 2002

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	)	RM-9245
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	)	

VERIFIED STATEMENT OF
EDMUND F. PETRUZZELLI

Edmund F. Petruzzelli hereby states as follows:

1. I am the Director of RF Technology for EchoStar Technologies Corporation, an affiliate of EchoStar Communications Corporation ("EchoStar"). I have a degree in electrical engineering, and have spent more than 24 years in the telecommunications engineering field. With a two-year interruption from 1997 to 1999, I have been with EchoStar in various capacities since 1991. In my current position, I direct and perform system level design activities for Direct Broadcast Satellite ("DBS") transmission and reception subsystems, provide technical support in communication system engineering tasks for corporate management, investigate and direct the development of new technologies, and support product development

activities. I am familiar with the matters set forth in this statement as a result of my employment with EchoStar.

2. The purpose of my statement is to analyze and comment on the technical rules adopted by the Federal Communications Commission ("Commission" or "FCC") in its *Second Report and Order* in this proceeding as applied to the proposed sharing of the 12.2 - 12.7 GHz spectrum ("the 12 GHz band") between DBS and Multipoint Video and Data Distribution Service ("MVDDS"). In the course of my statement, I will also supply certain facts relevant to an evaluation of those technical rules.

3. One of the principal components of the Commission's proposed system for placing MVDDS into the 12 GHz band is a set of regional limits on the equivalent power flux density ("EPFD") at DBS satellite receiver locations resulting from MVDDS transmissions. A description of the model, including the detailed computational steps, is set forth in Appendix G to the *Second Report and Order.* Based on my review of the *Second Report and Order*, and in particular Appendix G, I conclude that the Commission's EPFD model is flawed and must be modified to make it even minimally useful as a means to establish workable limits on harmful interference to DBS from MVDDS.

4. The main flaw in the Appendix G model is that it does not impose *any* firm limit on the amount of increased unavailability of DBS service that can be caused by MVDDS interference. Instead, as the *Second Report and Order* discusses, the Commission apparently used an increase in unavailability of 10 percent as a "starting point," with no actual ceiling on the amount of harmful interference particular customers at particular locations could be expected to endure. Contrary to the order, however, the "starting point" concept is meaningless, since it is the ceiling, not the floor or the average, that matters from a harmful

interference standpoint. In other words, the relevant issue should be how much harmful interference particular DBS customers will experience as a result of MVDDS transmissions. It is small consolation to customers who may encounter up to a *30 percent increase* in unavailability that other customers will be less impacted and, on average, the increased unavailability may fall below a particular threshold. Thus, the model should not be based on a "starting point" approach, but on a firm ceiling approach to EPFD limits.

5. Even if the "starting point" concept were valid, the Commission's model fails to meet its own 10 percent standard. In fact, in 31 of 32 cities studied, the 10 percent limit is exceeded for at least one, and in some cases more than one, of the full-CONUS satellite locations the Commission considered.[1] Out of 96 possible combinations (32 cities multiplied times 3 full-CONUS satellite slots), 51 of those (or more than 53%) show increases in unavailability of 10 percent or greater, with the increases ranging as high as 30.2 percent. Moreover, as the order acknowledges, the median increase across the 32 cities is more than 10 percent, and the mean is approximately 11.9 percent. These figures all indicate that the 10 percent "starting point" is not a meaningful part of the model, much less a firm ceiling on harmful interference to DBS.

6. Apart from the fact that the model is not constructed in such a way that it produces a firm ceiling on increased unavailability of DBS service, it suffers from other significant flaws as well. First, because the model averages the results from 32 cities across broad multi-state regions, it completely disregards local variations in conditions at other locations within each region. There are, for example, 210 Designated Market Areas ("DMAs")

[1] Three of the orbital slots serving the United States (101°, 110°, and 119° West longitude) provide coverage for the entire continental U.S., and are referred to as "full-CONUS" satellite locations.

in the United States where local broadcast television service is provided. More than 175 of those DMAs are not included in the Commission's EPFD calculations, even though the Commission proposes to offer MVDDS licenses in each of those markets (and in fact, in areas that are even smaller in many instances than DMAs). Second, the model fails to incorporate calculations for satellite slots that do not provide full-CONUS coverage, but are nonetheless currently used to provide significant DBS service to hundreds of thousands of DBS customers.

7. If a 10 percent increase in unavailability of DBS service is to be the standard for harmful interference (recognizing that EchoStar believes a much lower limit should be set), then the EPFD model should be designed in such a way that it ensures the 10 percent standard will not be exceeded in any city for any satellite location. The Commission's use of a "double average" approach (which involves averaging three satellite locations for each major city and numerous major cities for each of four regions) masks the fact that in many cases the Commission's EPFD limits would permit increases in DBS unavailability of 20-30 percent (or more) in particular cases. In order to calculate appropriate EPFD limits, the Commission should have ensured that the 10 percent increased unavailability standard was met in every case, not merely across broad averages.

8. The order states that it adopted a regional approach because not requiring a separate calculation for each transmitting location "provides a simple regulatory framework for our licensees." ¶ 84. It also suggests that regional EPFD limits will permit DBS carriers to "reap all the benefits of upgrading their system." ¶ 84. However, given that the model already exists, establishing EPFD limits for each city and existing satellite location would be equally simple (and more appropriate since MVDDS licenses are to be awarded on a local basis). In any event, the goal of regulatory simplicity by itself is not enough to outweigh the burdens imposed

on DBS carriers and their customers in the form of increased unavailability of service. Finally, while I agree that DBS carriers should be permitted to reap the benefits of upgrading their system, the same end could be obtained by setting EPFD limits for each location based on current system design, rather than re-calculating the limits each time a new satellite is introduced.

9. The order states (at ¶ 84, note 210) that "the instances where unavailability was on the order of 20-30% occurred only in the case of the satellite at 110°." As noted further below, this statement disregards the satellite locations at 61.5° and 148° West longitude. Moreover, the Commission goes on to suggest that the DBS satellite at 110° "is scheduled to be replaced with a newer higher-powered satellite well in advance of MVDDS deployment," which will supposedly "reduce service unavailability due to MVDDS." This statement is not accurate. Echo V, the EchoStar satellite currently in service at 110°, is a 120-Watt TWT design. EchoStar's new satellite at 110°, Echo VIII, has the same 120-Watt TWT design. Thus, I am not aware of any reason to conclude that EchoStar will be able to avoid the increased unavailability from the 110° slot because of a "newer higher-powered satellite" that will be in place prior to MVDDS deployment.

10. As noted above, the model should also have been designed to include the "wing" satellite locations at 61.5° and 148° West longitude as a direct part of the calculation.[2] The order states that the Commission engaged in a "modeling effort" for the wing satellites that "showed that these satellites will receive sufficient protection from MVDDS under our adopted *EPFD limits.*" ¶ 82. Examination of Appendix G reveals, however, that the increases in

[2] In contrast to full-CONUS satellite locations, "wing" satellite slots only provide partial coverage of the continental United States. Also, because of the location of the wing satellites, EchoStar customers generally require a secondary antenna in order to receive the signals from the 61.5° or 148° slots.

unavailability from the wing satellites range as high as 30.6% in the case of 61.5° West longitude and 28.5% in the case of 148° West longitude, which is roughly three times the Commission's prescribed "starting point" of 10 percent. Moreover, those increases are based on only a small sample of cities that the Commission does not claim is representative of the country as a whole.

11. The order also seems to take the view that it is not important to protect transmissions from the wing satellites because they are "used for specialty programming or are not currently used at all." ¶ 82. This is a distorted view of the facts. EchoStar makes extensive use of its wing satellites to provide programming, including foreign language programming, high definition television, and local channels in a number of major cities. Hundreds of thousands of EchoStar subscribers have obtained secondary antennas in order to receive this programming, and the number is growing daily. From EchoStar's point of view, and that of its customers, interference with these existing services is every bit as serious as interference with transmissions from the full-CONUS slots.

12. The order sets forth a "safety valve" procedure under which a DBS provider can seek an adjustment to the regional EPFD limit if it can show a "tangible detrimental impact on DBS caused by MVDDS operations." ¶ 85. The order does not define what is necessary to demonstrate a "tangible detrimental impact," particularly in advance of actual MVDDS operations. More importantly, this "safety valve" approach is not an adequate substitute for specifying EPFD limits for each city where an MVDDS license may be awarded. The model needs to specify an EPFD limit that imposes a firm ceiling on the increased unavailability that can occur in each local market in order to take account of localized conditions that may lead to greater than average increases in unavailability.

13. The *Second Report and Order* repeatedly states that DBS customers will not be able to perceive (or will not care about) increases in unavailability of DBS service in the range of 10-30 percent. *E.g.*, ¶ 85. This view is contrary to the business realities of the DBS marketplace and my experience as a long-time participant in this industry. EchoStar and DIRECTV have invested hundreds of millions of dollars in equipment and technology to attain the current high level of reliability of service (typically, 99.8 percent or better). This investment was necessary both to meet customers' expectations regarding reliability of service and to avoid the competitive threat from cable. In particular, in the early days of DBS, cable companies frequently emphasized in their marketing that DBS service was potentially subject to outages in the event of rain. EchoStar and DIRECTV have therefore made strenuous efforts to bring their systems to a state of reliability sufficient to blunt those competitive claims by cable operators. It is simply contrary to basic economic principles (and common sense) to think that the DBS providers would have invested so much money to achieve this high degree of reliability if they thought customers did not care about this issue.

14. The *Second Report and Order* refers to natural variations in service availability from region to region and from season to season as part of its rationale for concluding that additional increases in unavailability will not be perceptible to consumers. *Second Report and Order*, ¶ 84 n.210. Again, this reflects a misperception of the realities of the industry. Consumers generally learn what to expect from *their* service at *their* location. They are not in a position to compare their service to what is available in other cities around the country. In fact, if they did, they might well reach the wrong conclusion. For example, a common view is that the Pacific Northwest is a relatively rainy region. However, the rate of unavailability of DBS service in cities like Seattle and Portland, Oregon, is actually lower than

the unavailability in many East Coast cities, where rain is less frequent but more severe when it occurs. The important point is that consumers will be much more aware of a change from the norm they have come to expect at their own location than they will be of their relative status compared to other cities. That is, customers in a particular city may anticipate (and tolerate) occasional brief outages due to weather, but if the outages suddenly become more frequent or more lengthy, I believe they would definitely be noticed by many DBS subscribers. Moreover, when customers detect a change from the norm, they will not necessarily associate it with the existence of MVDDS service, but will be more likely to blame their DBS provider.

15. Faced with the loss of reliability that will occur if MVDDS service is introduced on the terms contained in the *Second Report and Order*, DBS providers could try to restore some of the reliability in service they seek to obtain by increasing the "effective power" transmitted to the satellite dish. In the near term, that cannot be done by increasing the power at the satellite itself, since the existing satellites in orbit have a finite power capacity. However, the "effective power" at the dish can be enhanced by changing the error correction rate, thereby effectively transmitting fewer channels but at a lower required carrier to noise at threshold. Given the current severe constraints on DBS channel capacity, particularly after the must-carry rules went into effect at the beginning of 2002, the result of pursuing this course would be to deprive consumers of additional channel offerings and to impose very substantial costs on DBS providers.

16. In addition to its EPFD limits, the *Second Report and Order* also relies heavily on the idea that on-site mitigation measures can be used to protect DBS customers (and particularly new customers) against MVDDS interference. However, the on-site mitigation measures the Commission has suggested are generally either impractical or ineffective. For

example, relocating the DBS dish to avoid MVDDS inteference is only feasible in limited circumstances (if at all). Recent EchoStar installation data indicates that, in up to 10 percent of cases, there is only one available location for the DBS antenna at a given residence where a usable DBS signal can be received. If that location is not "shielded" from MVDDS interference, the customer may not be able to receive DBS broadcasts at all. Moreover, even when more than one location is viable, none of the available locations for receipt of a DBS signal may be "shielded" from MVDDS interference.

17. In effect, the Commission is assuming that installers can "thread the needle" by finding a location that is both suitable for DBS reception and totally shielded from MVDDS interference. This task is made even more problematic by the likelihood of multipath interference (that is, MVDDS signals bounced off of natural terrain, buildings and other objects on the ground). If signals are coming from multiple directions, it becomes even harder to find a dish location that is "shielded" against MVDDS interference. In fact, the whole issue of multipath interference seems to have been disregarded by the Commission in this order. Added to this factor is the distinct possibility that, in line with the MITRE findings, the MVDDS transmitters may turn out to be north-facing (that is, they may point towards the south side of homes and buildings, where most DBS dishes are installed). Such an orientation (which the Commission's order leaves entirely open) would further reduce whatever possibility exists of "shielding" DBS dishes from MVDDS interference.

18. There are also significant problems with the Commission's proposal of "clip-on shields." On the one hand, if the "clip-on shield" is a light, flimsy screen, it is likely to blow off the dish in stormy or windy conditions (potentially, when it is needed most). On the other hand, if the shield is a rigid attachment to the dish, it is likely to compromise the wind-

loading of the dish, which increases the vulnerability of the entire installation. The increased wind-loading may also affect the type of installation that can be done, particularly in areas prone to high winds, such as the Gulf Coast and Atlantic Seaboard. In some cases, light masts may have to be replaced with heavier masts and/or be anchored by guy wires. Such installations are both more expensive and less acceptable to homeowners. In fact, whatever the design of the "clip-on shields," they will undoubtedly create aesthetic issues and cause increased customer resistance.

19. The suggestion that DBS providers install "larger or better operating" DBS receive dishes is also impractical. Customer acceptance of DBS service has been closely related to the use of small, 18-inch satellite dishes. Where EchoStar has found it necessary to require substantially larger dishes (for example, in Alaska, Hawaii and the Virgin Islands), customer acceptance rates have been much smaller than average. Substantially larger dishes also create installation issues that are even more severe than those discussed above in connection with "clip-on shields." For example, large antennas can rarely if ever be mounted to the home and more often need permanent mounting into concrete. Since they are located mostly away from the home, cable routing is complicated, often requiring aerial supports or trenching. Nor has anyone come forward with a practical proposal in this proceeding for a "better operating" dish that would avoid the interference problems that have been documented by MITRE and the parties to this case.

20. Another serious practical issue involving the application of the rules adopted in the *Second Report and Order* is the absence of a standard for field measurements of EPFD values so that DBS carriers and customers can readily establish whether EPFD limits have been exceeded at particular locations. The theoretical model set forth in Appendix G is far too

complex to be applied by installers and other personnel in the field. Because of its extreme complexity, it is also highly prone to computational errors. The consequence is that if the Commission's model predicts that a given location will not experience an EPFD in excess of the limit, there is no practical way to demonstrate that, in fact, the limit is exceeded at that location. This lack of a verifiable field standard is a serious flaw in the process. It virtually guarantees that there will be frequent and complex disputes about EPFD compliance once an MVDDS system begins operating. Moreover, this flaw means that many of the Commission's proposed mitigation techniques simply cannot be implemented in practice, because the installers will have no way to tell when they have adequately "shielded" a particular DBS dish from an excessive level of EPFD.

21. The Commission also has put forward a model for predicting the contours of the MVDDS transmitter signal, which is set forth in Appendix J. The statistical accuracy of the contour model is not spelled out, however, nor is it apparent what all of its relevant assumptions are. Therefore, it is difficult to tell whether there may be significant disputes about what DBS customers should be considered to be affected by MVDDS transmissions.

22. The proposed rules require that DBS providers must disclose to an MVDDS competitor a list of all new DBS installations within 30 days of receiving the MVDDS competitor's notice of its transmitter site. In the business environment in which the DBS industry operates, this requirement is unreasonable and invades the DBS providers' private commercial information. The number and location of new DBS installations is proprietary information that is closely held within the company and would never be shared with an MVPD competitor. It costs a great deal of money in terms of marketing, installation and equipment costs to sign up a new subscriber to DBS service. Loss of new customers to a competing service

is thus a very costly matter for a DBS provider. The risk of competitive misuse of information about new DBS customers is particularly serious when the MVDDS operator is starting up its own new operation and looking for its own customers, which is exactly the time when the rules would require this information to be disclosed to the MVDDS competitor. Also, the customers themselves may feel that their privacy is being invaded if their identity and location is disclosed to a company which may then contact them directly, whether in the context of seeking a "waiver" of the EPFD limits or suggesting that the customer switch to MVDDS service.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 26, 2002.

Edmund F. Petruzzelli

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing joint petition for reconsideration and statement of Edmund F. Petruzzelli was served on July 26, 2002, via hand delivery (indicated by *) or by first class mail, upon the following:

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