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	)	ET Docket No. 98-206
of NGSO FSS Systems Co-Frequency with	)	RM-9147
GSO and Terrestrial Systems in the Ku-Band;	)	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	)	

PETITION FOR RECONSIDERATION

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SUMMARY

The Commission's rules for sharing between Multichannel Video Distribution and Data Service ("MVDDS") and non-geostationary satellite orbit ("NGSO") Fixed-Satellite Service ("FSS") in the 12.2-12.7 GHz band are patently inconsistent with the co-primary allocation of these services. They fail to protect NGSO FSS user terminals and impose unnecessary burdens on NGSO FSS operators.

In the First Report & Order, the Commission allocated NGSO FSS and MVDDS systems in the 12.2-12.7 GHz band on a co-primary basis, indicating its confidence that it could develop rules to prevent MVDDS interference from threatening the viability of NGSO FSS operations. However, the sharing rules adopted in the MO&O and Second Report & Order do not achieve this goal. The Commission acknowledges that "first-in" systems will be afforded more and better use of the 12.2-12.7 GHz band. However, in reality, if NGSO FSS systems are not first-in, the Commission's rules are critically deficient in protecting these systems from interference from MVDDS transmitters, relegating the NGSO FSS operations to *de facto* secondary status.

In fact, the Commission failed to adopt a single limitation on MVDDS operation that will adequately protect a later-deployed NGSO FSS user terminal from in-band MVDDS emissions. The limitations on MVDDS operations it has adopted are either cosmetic, or were designed to protect DBS, not NGSO FSS, systems. As a terrestrial service, MVDDS will likely be in a position to deploy more rapidly, particularly in urban areas, leaving NGSO FSS systems to suffer the interference environment created by such deployment. Thus, the absence of any reasonable protection to later-deployed NGSO FSS user terminals constitutes a fatal flaw in the Commission's sharing regime.

At the same time, the Commission has imposed limitations on NGSO FSS systems that require reductions in NGSO FSS system coverage or capacity, even in cases where there is no benefit to any MVDDS customer. These limitations, which already exceed international requirements for protection of terrestrial systems in the band, should be implemented on an operational basis only.

The Commission's co-primary allocation was founded on the assumption that co-frequency sharing between NGSO FSS and MVDDS systems is feasible. Under the current rules, it is not. SkyBridge's earlier proposal for NGSO FSS/MVDSS sharing demonstrates – without contradiction – that equitable sharing, while difficult, can be achieved if rigorous rules are adopted. SkyBridge therefore urges the Commission to reconsider the rules adopted in the MO&O and Second Report & Order, and adopt instead rules more closely based on the SkyBridge proposal.

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To: The Commission

PETITION FOR RECONSIDERATION

SkyBridge L.L.C. ("SkyBridge"), by its attorneys, hereby petitions the Commission to reconsider various aspects of the Commission's Memorandum Opinion and Order and Second Report and Order in the above-captioned matter,[1] specifically certain of the rules adopted therein for frequency sharing between non-geostationary satellite orbit

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[1] FCC 02-116, released May 23, 2002. Herein, the Memorandum Opinion and Order will be denoted "MO&O" and the Second Report and Order will be denoted "Second Report & Order" or "Second R&O". The MO&O and Second R&O stem from a First Report and Order and Further Notice of Proposed Rulemaking in the same docket. See FCC 00-418, released December 8, 2000. The First Report & Order will be denoted "First Report & Order" or "First R&O." The Further Notice of Proposed Rule Making will be denoted "Further Notice" or "FNPRM." On March 19, 2001, SkyBridge filed a Petition for Reconsideration of certain aspects of the First Report & Order (the "First SkyBridge Petition"). On March 12, 2001, SkyBridge filed its comments on the Further Notice (the "SkyBridge FNPRM Comments"), and on April 5, 2001, filed its reply comments (the "SkyBridge FNPRM Reply Comments").

("NGSO") Fixed-Satellite Service ("FSS") systems and Multichannel Video Distribution and Data Service ("MVDDS") systems in the 12.2-12.7 GHz band. The Commission's rules fail to establish a regime that permits significant co-frequency sharing between these services. The rules are therefore inconsistent with the co-primary allocation of these services in the band, and with U.S. obligations under agreements reached – with the support of the United States – at WRC-97 and WRC-2000.

I. INTRODUCTION

In the First Report & Order, the Commission allocated NGSO FSS and MVDDS systems in the 12.2-12.7 GHz band on a co-primary basis. In doing so, the Commission stated that it was "confident that MVDDS transmitters will not threaten the viability of NGSO FSS downlink operations."[2] In the Second Report & Order, the Commission stated that "[t]he technical rules and regulatory safeguards we are adopting . . . will protect . . . the co-primary NGSO FSS operators in the 12 GHz band."[3]

However, the sharing rules adopted in the MO&O and Second Report & Order do not achieve this goal. Indeed, just the opposite is the case. The Commission acknowledges that "first-in . . . systems will be afforded more and easier use of the shared 12.2-12.7 GHz portion of the spectrum."[4] However, in reality, if NGSO FSS user terminals are not "first-in," the rules adopted in the Second Report & Order are critically deficient

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2 First R&O, ¶ 225.

3 MO&O and Second R&O, ¶ 4. The Commission also stated that its rules "ensure that MVDDS and NGSO FSS can share the 12 GHz band while preserving the integrity of the co-primary status of both operations." MO&O, ¶ 19.

4 Second R&O, ¶ 111.

with respect to interference protection from MVDDS transmitters, relegating NGSO FSS systems to *de facto* secondary status. The Second Report & Order also imposes significant burdens on NGSO FSS operators that are entirely unnecessary for the protection of MVDDS operations. This, too, is inconsistent with the Commission's co-primary allocation in the First Report & Order.

As SkyBridge explained in its First Petition, in the case of ubiquitous services, such as NGSO FSS and MVDDS, the allocation of a band for two (or more) co-primary services is practical only if both services can operate co-frequency according to equitable sharing rules. To meet this goal, the Commission must require each of the co-primary services to operate within certain boundaries, to permit the effective operation of both services, no matter which system may deploy first in a given area. The limitations imposed must be carefully crafted to afford the necessary protection to each of the services, while at the same time avoiding unnecessary or debilitating burdens on either service.[5]

The Second Report & Order utterly fails to establish rules for NGSO FSS/MVDDS sharing that achieve this necessary result. As demonstrated herein, the Commission did not adopt a single limitation on MVDDS operation that will adequately protect a later-deployed NGSO FSS user terminal from in-band MVDDS emissions. As a terrestrial service, MVDDS will likely be in a position to deploy more rapidly, particularly

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[5] The Commission has followed this course rigorously in every other aspect of the proceedings relating to NGSO FSS operations in the subject band. NGSO FSS was allocated on a co-primary basis in the band only following years of exhaustive studies, negotiations, and eventual agreement with DBS operators on detailed sharing rules. The final rules permit both services to co-exist, no matter which deploys first, and ensure that both services will enjoy the interference protection inherent in co-primary operation.

in urban areas, leaving NGSO FSS systems to suffer the interference environment created by such deployment. Thus, the absence of any reasonable protection to later-deployed NGSO FSS user terminals constitutes a fatal flaw in the Commission's sharing regime, and threatens to nullify the co-primary allocation to NGSO FSS systems in the band.

This result was not inevitable. SkyBridge developed and exhaustively documented a sharing regime (the "SkyBridge Proposal") that would permit both services to operate, no matter which deploys first, while equitably distributing the burdens of such sharing.[6] While the Commission, in the MO&O and Second Report & Order, ostensibly appears to agree with many of the principles upon which the SkyBridge Proposal was based, in the end the Commission rejected virtually every aspect of the Proposal, without rational explanation (in some cases, without any explanation at all).

II. THE SECOND REPORT & ORDER FAILS TO IMPOSE ANY MEANINGFUL CONSTRAINTS ON MVDDS OPERATIONS FOR THE PROTECTION OF NGSO FSS SYSTEMS.

A. The Commission Fails to Demonstrate that the SkyBridge Proposal is Overly Complex or Burdensome.

The SkyBridge Proposal, submitted prior to the FNPRM, offered a sharing regime that would allow both NGSO FSS and MVDDS operators to co-exist, no matter which service deployed first in a given area. The SkyBridge Proposal would adequately protect NGSO FSS user terminals from MVDDS interference. At the same time, the SkyBridge Proposal would provide MVDDS operators maximum flexibility, including the ability to operate according to the stated technical parameters of Northpoint Technology,

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[6] See *Ex Parte* Communication of SkyBridge, ET Docket No. 98-206, July 10, 2000.

in urban areas, leaving NGSO FSS systems to suffer the interference environment created by such deployment. Thus, the absence of any reasonable protection to later-deployed NGSO FSS user terminals constitutes a fatal flaw in the Commission's sharing regime, and threatens to nullify the co-primary allocation to NGSO FSS systems in the band.

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6 See *Ex Parte* Communication of SkyBridge, ET Docket No. 98-206, July 10, 2000.

Ltd. ("Northpoint"), the leading MVDDS proponent. To meet these goals, the Proposal involved three sets of power-flux density ("PFD") or equivalent PFD ("EPFD") limits to protect NGSO FSS user terminals from in-band MVDDS emissions:[7]

- PFD limit of –120 dB(W/m2/MHz), applicable over 90% of the MVDDS transmitter's service area.
- EPFD limit of –135.1 dB(W/m2/4 kHz), applicable over 99.8% of the MVDDS transmitter's service area.
- EPFD limit of –132.1 dB(W/m2/4 kHz), applicable into any *operational* NGSO FSS user terminal.

Each of these limits addresses a different protection requirement of NGSO FSS user terminals. The combination of the three avoids imposing limits that unnecessarily constrain MVDDS operators.

There is no evidence on the record indicating that the SkyBridge Proposal will not meet the requirements of both NGSO FSS and MVDDS operators. The Commission certainly has not disputed this. However, the Commission states that the SkyBridge proposal is "too complex on its face and would be inordinately burdensome in practical application."[8] As demonstrated below, there is no basis for that conclusion, in the record or otherwise, and the conclusion is flatly inconsistent with other co-primary sharing regimes adopted in this very proceeding.

As an initial matter, the Commission's conclusion contradicts its position in adopting the sharing regime for NGSO FSS and Direct Broadcast Satellite Service ("DBS") systems in the same band. The NGSO FSS/DBS sharing rules are far more complex than

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7 See, e.g., SkyBridge FNPRM Comments at 33-38.

8 Second R&O, ¶ 118.

anything SkyBridge proposed for NGSO FSS/MVDSS sharing, and indeed are far more burdensome than those adopted internationally at WRC-2000 for NGSO FSS/DBS sharing.[9] In the DBS context, the Commission never shied away from increasing the complexity of the sharing rules, if, in its view, doing so aided in facilitating sharing. Yet, in the instant NGSO FSS/MVDDS context, the Commission inexplicably now rejects a proposal based on those very same sharing mechanisms as "too complex."[10]

More importantly, the uncontradicted evidence in the record demonstrates that simplification is not feasible if sharing between these two services is to be achieved. As is evident from the rules for both NGSO FSS/DBS and DBS/MVDDS sharing, rules for sharing among ubiquitously deployed services cannot be both simple and effective. In fact, because NGSO FSS user terminals will from time to time point directly at MVDDS transmitters, this sharing scenario is the most complex of the three the Commission has had to address in the band.[11]

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9 For example, as detailed in SkyBridge's petition for reconsideration of those rules: (1) the Commission's rules for assessing compliance with the validation EPFD limits require showings that are not contemplated by the ITU-approved validation software specification, and that are not needed for ensuring compliance with the limits themselves; and (2) the Commission's rules for assessing compliance with the operational-type EPFD limits require pre-operational demonstrations of compliance, which is wholly inconsistent with the purpose and design of these limits, and essentially treats the operational limits as more constraining validation limits. See First SkyBridge Petition at 26-42.

10 Second R&O, ¶ 118.

11 See First R&O, ¶ 224. As the Commission notes, "[w]hile Northpoint's proposed technology was designed to share spectrum with DBS operations, sharing with NGSO FSS downlinks is more complicated." Id.

The Commission has acknowledged that sharing between multiple satellite and terrestrial systems involves "extremely complex engineering and interference concerns"[12] and necessitates "more complicated and creative sharing arrangements."[13] In particular, the Commission has concluded that sharing between the NGSO FSS and MVDDS will be "complex"[14] and "will require careful planning and engineering."[15] Yet the Commission adopted a regime whose only apparent virtue is that it is "relatively uncomplicated."[16] It is simply not possible to take short-cuts in regulating co-primary sharing between these two services. As SkyBridge has repeatedly demonstrated – without contradiction – a multi-faceted approach is required.

B. The Commission's Proposed Rules for Protection of NGSO FSS User Terminals From In-Band MVDDS Emissions Are Fatally Flawed.

The only limitation the Commission adopted for protection of NGSO FSS receivers from in-band emissions of pre-existing MVDDS transmitters is a requirement that the MVDDS transmitter may not exceed a PFD of –135 dB(W/m^2/4kHz) at distances greater than 3 km from the MVDDS transmitter.[17] The Commission characterized this limit as "that proposed by SkyBridge for an NGSO FSS receiver saturation buffer zone."[18]

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12 MO&O, ¶ 35.

13 Id., First R&O, ¶ 224.

14 FNPRM, ¶ 279.

15 Id., ¶ 224.

16 Id., ¶ 113.

17 Id., ¶ 112.

18 Id.

However, as the Commission acknowledges, because this level approaches the saturation threshold of the NGSO FSS receivers, SkyBridge proposed that this PFD limit be enforced much closer to the MVDDS transmitter than 3 km.[19] Moreover, the –135 dB(W/m^2/4kHz) value protects only against saturation of the NGSO FSS receivers, and does not protect against unacceptable interference. With the limit established in the Second Report & Order, not only will a large number of NGSO FSS user terminals be excluded from the 12.2-12.7 GHz band due to saturation, but a much larger number, located beyond 3 km from the MVDDS transmitter, will be excluded due to unacceptable interference.

With the limit adopted in the Second Report & Order, the Commission claims that the SkyBridge "frequency diversity zone" (in which unacceptable interference would be received) will be no greater than 20% of the MVDDS service area, and the SkyBridge "saturation zone" will be no greater than 2.5% of the MVDDS service area. First, however, this leaves an unacceptably large percentage of SkyBridge user terminals encumbered by MVDDS interference, which affects both the capacity and costs of the system.[20] Even worse, these figures were computed using the maximum expected MVDDS service area diameter,[21] a figure significantly greater than the 10 mile/16 km diameter

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19 The Commission fails to acknowledge, however, that SkyBridge proposed this as an EPFD limit, taking into account emissions from all transmitters, not a PFD limit, applicable to each transmitter separately.

20 See SkyBridge FNPRM Comments at 26-29; SkyBridge FNPRM Reply Comments at 9.

21 Second R&O, ¶ 116-17.

"typical" Northpoint service area.[22] The percentages of affected NGSO FSS user terminals could be even larger for Northpoint's "typical" case, not to mention cases cited by Northpoint in which service areas may be as small as 1 km.[23] In either of such cases, it is obvious that permitting interference approaching saturation levels into NGSO FSS user terminals out to 3 km will significantly constrain NGSO FSS service, far beyond even that contemplated by the Commission in the MO&O and Second Report & Order.

As the above discussion illustrates, the Commission's interference calculations are, in fact, baseless. Because there is nothing in the Commission's rules that bounds the minimum size of the service area, the size of the frequency diversity zone and saturation zone relative to the MVDDS service area can be significantly larger than that claimed by the Commission, depending on MVDDS system design. Moreover, these zones will exist in populated areas. In Northpoint's illustrative deployment scenario for the Washington, D.C. area, Northpoint used 23 transmitters to cover 40 km radius area.[24] Each of these 23 transmitters would produce an interference and saturation zone, clearly affecting provision of NGSO FSS services to homes and offices.

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22 See First R&O, ¶ 225, n.482; Letter from Bob Combs of Northpoint, to Jim Chadwick of MITRE, filed in ET Docket No. 98-206, January 31, 2001 ("First Northpoint Response to MITRE Questions"), at 2.

23 First Northpoint Response to MITRE Questions at 2. While it might be expected that MVDDS systems using smaller service areas would also use lower power, there is nothing in the rules that requires this.

24 See First R&O, ¶ 225, n.482. Moreover, Northpoint anticipates 10-15,000 such service areas nationwide.

As SkyBridge has repeatedly explained, the percentage of affected user terminals is the critical parameter for assessing the burdens on NGSO FSS systems.[25] Under the Commission's rule, the percentage of NGSO FSS user terminals affected is not limited by any protective measure, and can vary as a function of the size of the MVDDS service area for each transmitter. This is why SkyBridge proposed that the limits on MVDDS operation be correlated to the size of the service area, and not an absolute distance. With the 3 km rule adopted by the Commission, NGSO FSS operators have no assurance whatsoever that the percentage of terminals adversely affected will be sufficiently low so as to permit an economically viable service.

C. The Commission Fails to Show Any Relationship Between Its Rules and The Protection Requirements of NGSO FSS Systems.

The Commission defends its approach on the basis that it is "relatively uncomplicated and will not be burdensome for compliance by licensees."[26] It is clear, however, that the Commission is speaking only of MVDDS licensees. As shown below, the requirement imposes no additional constraints whatsoever on MVDDS systems for protection of NGSO FSS systems.

The Commission acknowledges that this limit imposes essentially no additional constraint not already imposed by the 14 dBm MVDDS transmitter power limit adopted for protection of DBS systems. In discussing why it decided to impose the limit at 3 km, instead of closer to the transmitter as SkyBridge had proposed, the Commission

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25 See, e.g., SkyBridge FNPRM Comments at 26-29; SkyBridge FNPRM Reply Comments at 9; *Ex Parte* of SkyBridge, ET Docket 98-206, November 15, 2001.

26 Second R&O, ¶ 113.

states that, "fixing the distance at 3 km for the –135 dBm/m^2/4kHz saturation limit would allow for an unrestricted EIRP of 14 dBm with any antenna type and height."[27]

As the Commission also clearly acknowledges, the 14 dBm value was derived based on DBS protection requirements.[28] However, the Commission admits these requirements are different from NGSO FSS protection requirements, due to the fact that the NGSO FSS user terminals will, from time to time, point toward the MVDDS transmitters.[29]

In fact, there is no indication in Second Report & Order that the "3 km" distance was derived based on any NGSO FSS protection requirements. Rather, in the absence of any other rationale in the record, the 3 km PFD limit appears intended solely to eliminate any meaningful constraint on MVDDS operation. The resulting rule, which appears entirely cosmetic, is indefensible.

Indeed, in the end, the Commission makes it clear that it had no intention of protecting NGSO FSS user terminals that are deployed after an MVDDS transmitter in the vicinity. The Commission states:

> NGSO FSS receivers that are later installed within an existing MVDDS service area, particularly those sited within 3 km of existing MVDDS transmitting antennas, may experience some degree of in-band interference that could encumber NGSO FSS

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27 Second R&O, ¶ 116 n.257. See also id., ¶ 112 n.254 (noting that in some configurations, somewhat lower EIRPs would be required to meet the limits, but proposing methods for ensuring that MVDDS operators may use "essentially the full EIRP for most antenna heights").

28 Second R&O, ¶¶ 197-198. More specifically, 14 dBm is the value recommended in the MITRE report for protection of DBS system.

29 First R&O, ¶ 225.

> operation in the 12.2-12.7 GHz band. However, NGSO FSS receivers would still have access to the remaining 500 megahertz of spectrum in the lower 11.7-12.2 GHz band for downlink service.[30]

The Commission's conclusion is incorrect in two vital respects.

First, the situation is far more complicated than suggested by the Commission in the above quote. The Commission explicitly relies on the assumption that the NGSO FSS system (1) can employ frequency diversity and (2) can prevent saturation, when forced to use the lower 11.7-12.2 GHz band, via "sufficient signal discrimination characteristics and/or narrower bandwidth front-ends."[31] Nothing in the record justifies reliance on these assumptions.

As SkyBridge has demonstrated, the first assumption is not correct, unless certain other restrictions are placed on MVDDS operations.[32] Frequency diversity is only feasible – without significant reductions in system efficiency, and hence capacity – if limits are imposed on the MVDDS terminals to ensure that the number of user terminals affected by MVDDS interference is small. In the SkyBridge Proposal, SkyBridge accepted 10% for the percentage of terminals that may be affected, which coincides with the figure long claimed by Northpoint as the percentage of terminals its system would adversely affect.[33] As demonstrated above, the rules adopted in the Second Report & Order utterly fail to meet

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30 Second R&O, ¶ 108.

31 Second R&O, ¶ 109.

32 See, e.g., SkyBridge FNPRM Comments at 26-29; SkyBridge FNPRM Reply Comments at 9; SkyBridge *Ex Parte*, ET Docket 98-206, November 15, 2001.

33 See Comments of Northpoint Technology, Ltd., ET Docket 98-206, March 29, 1999, Technical Annex, at 32.

this requirement. Therefore, these rules do not permit effective use of frequency diversity, and allow MVDDS interference to significantly reduce the capacity of NGSO FSS systems.

The Commission's second assumption is also not correct. The Commission's proposal would require that the NGSO FSS provider develop a second line of user terminals that will not operate in the 12.2-12.7 GHz band. NGSO FSS consumer user terminals are extraordinarily complex, and keeping their costs down is one of the most challenging aspects of system design. Customizing terminals for different deployment scenarios will increase those costs significantly.

Moreover, even if the situation were as simple as the above quote suggests, such an approach does not constitute frequency sharing. It allows MVDDS systems to operate relatively unfettered, while any NGSO FSS user terminals affected by such operation are excluded from the band. It places a *de facto* practical bar against economically-viable NGSO FSS operations in the 12.2-12.7 GHz band. This result is wholly at odds with the agreements reached at WRC-97 and WRC-2000 – agreements specifically supported by the United States – to permit NGSO FSS operation in the 12.2-12.7 GHz band. Although the Commission went to great pains to make it appear otherwise, the MO&O and Second Report & Order essentially relegate later-deployed NGSO FSS systems to *de facto* secondary status in the band.

III. THE CONSTRAINTS PLACED ON NGSO FSS SYSTEMS FOR THE PROTECTION OF MVDDS RECEIVERS ARE UNNECESSARILY BURDENSOME.

The Commission adopted PFD limits on NGSO FSS operations at low elevation angles that are up to 10 dB tighter than those adopted internationally (in Article S21 of the ITU Radio Regulations) for the protection of Fixed Service ("FS") systems, such as MVDDS, in the 12.2-12.7 GHz band.[34] The Commission's decision to adopt these tighter limits as "hard limits" and not "operational limits" is not supported by the record in this proceeding.

As an initial matter, the Commission's statements that "Northpoint and SkyBridge both agree that low angle NGSO FSS radiation should be limited"[35] and that "SkyBridge suggests that low angle radiation limitations for NGSO FSS satellite downlinks would be appropriate"[36] are entirely misleading. As SkyBridge has repeatedly demonstrated, Northpoint has never provided any rigorous analysis supporting the need to tighten the internationally-adopted PFD limits.[37] Nevertheless, as part of SkyBridge's efforts to reach a mutually-agreeable sharing regime, SkyBridge accepted Northpoint's

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34 Second R&O, ¶ 120. This itself is problematic. Because the Commission justified its grant of co-primary status to MVDDS by considering it part of the existing FS allocation, see First R&O and FNPRM, ¶ 2; MO&O and Second R&O, ¶ 1, it is entirely unclear what justification exists for adopting tighter limits to protect this new service. If MVDDS cannot operate within the norms of the FS service, the rationale for the co-primary allocation fails. See SkyBridge FNPRM Comments at 5, n.9; First SkyBridge Petition at 6, n.17.

35 Second R&O, ¶ 120.

36 Id., ¶ 100.

37 See, e.g., SkyBridge FNPRM Comments at 32, 44 n.75.

claim at face value, *provided that* a method for implementing the tighter limits is adopted that does not impose unnecessary constraints on NGSO FSS systems. The Commission's rules utterly fail to meet this proviso, and it is therefore flatly incorrect to claim that SkyBridge agrees with any aspect of the Commission's decision.

As the Commission is aware, in contrast to the situation with GSO systems, the PFD levels emitted by an NGSO FSS are not static, but vary with time in both the short term and long term. Adopting a PFD limit as a "hard limit," as the Commission has done in this case, requires that the NGSO FSS operator design its system to meet the limit in the potential worst-case configuration between the NGSO FSS satellites and an MVDDS receiver. This configuration depends on a number of factors, many of which vary over the life of the NGSO FSS system. The worst-case interference may never even exist into any operational MVDDS receiver. However, designing the system to meet the limit in the worst-case means that, in virtually all other cases, the NGSO FSS system must operate at levels substantially lower than the PFD limits, a situation that does not benefit any party.

A reduction in side-lobe power to meet the tighter limits requires a corresponding reduction in the power of the main beam. A systematic tightening of the Article 21 limits by 10 dB in all satellite pointing directions would result in either a reduction of NGSO FSS capacity over certain areas or an inability to maintain continuous coverage.[38]

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[38] SkyBridge FNPRM Comments at 30-32.

As SkyBridge has explained, as a practical matter, SkyBridge will in most cases meet the tighter limits in operation.[39] Moreover, Northpoint's own analysis indicates that the geographic regions over which its user terminals could be potentially affected by higher PFD are limited.[40] An MVDDS receiver will be adversely affected only if it happens to be placed in a worst-case alignment with respect to the NGSO FSS system *and* an NGSO FSS satellite happens to be emitting near maximum power in its direction.[41] Requiring an NGSO FSS system to reduce its power 10 dB across-the-board to protect against this unlikely scenario requires design changes that are extremely burdensome for NGSO FSS systems and not necessary for the protection of MVDDS systems.

In the SkyBridge Proposal, SkyBridge offered a method for protecting MVDDS systems while minimizing the burden to NGSO FSS systems. Specifically, SkyBridge proposed that the tighter limits be implemented as "operational limits," in a manner similar to those adopted internationally for NGSO FSS systems to protect GSO FSS and BSS systems.[42] In this way, NGSO FSS systems would not be bound to demonstrate compliance with these limits in cases where no MVDDS receiver would be

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39 See SkyBridge FNPRM Comments at 45-46.

40 See SkyBridge FNRPM Comments at 45 n.76. Only those MVDDS user terminals located at the edge of coverage of the MVDDS service area, where MVDDS power is low, could be affected. And in those regions, only those user terminals pointed in a direction in which an NGSO FSS satellite may, at some time, be seen near the horizon, could be affected. Because NGSO FSS satellites are not seen at the horizon in all azimuths, only two small portions of the edge of the service region could be affected. In addition, the affected area decreases as latitude increases.

41 SkyBridge FNPRM Comments at 46.

42 SkyBridge FNPRM Comments at 44.

affected, permitting the NGSO FSS operator to retain much-needed flexibility without in any way harming MVDDS operation. This proposal fully meets the stated protection requirements of Northpoint.

While the Commission ostensibly appears to accept the concept of "operational" limits,[43] it rejects the most fundamental aspect of the approach.[44] By requiring "an NGSO FSS applicant to demonstrate, prior to becoming operational, that it meets the PFD limits,"[45] the Commission is essentially requiring that NGSO FSS systems treat the PFD limits as "hard limits" and design their systems to meet them across-the-board, rather than permitting them to take steps to meet them only in cases where an MVDDS receiver could actually be harmed. In defending this approach, the Commission states merely that it does not "believe that making any of the PFD limits dependent on complaints or demonstration by MVDDS operators of violation of the limits would provide adequate or uniform protection."[46] However, the Commission has provided no evidence of

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43 Second R&O, ¶ 121.

44 The Commission made the same mistake with respect to the "operational" limits imposed on NGSO FSS systems for the protection of GSO FSS and GSO BSS systems. See, e.g., SkyBridge First Petition at 34. In that case, the Commission imposed requirements that NGSO FSS licensees demonstrate, via computer simulations, compliance with the "Operational Limits" and "Additional Operational Limits" prior to the commencement of service, which is clearly at odds with both the relevant decisions agreed to by the United States at WRC-2000, as well as with the basic premise of operational limits.

45 Second R&O, ¶ 121.

46 Second R&O, ¶ 121. The Commission neglects to mention that it fully supported this approach internationally, in the context of GSO/NGSO sharing.

any kind that the approach will not work in practice.[47] More importantly, the Commission utterly ignores the substantial harm to NGSO FSS systems in requiring it to meet limits in cases where they are not necessary for the protection of any MVDDS receiver.[48]

Finally, the Commission provided no guidelines for how a licensee would demonstrate compliance with this limit. As explained above, NGSO FSS operation is complex and changes with time. In the absence of an agreed methodology for demonstrating compliance, any showing made will be susceptible to considerable dispute by parties opposing entry of the NGSO FSS system. This regulatory uncertainty, which will arise just ninety days prior to commencement of operation by the NGSO FSS system, will chill interest and investment in NGSO FSS systems. It will also enormously complicate the Commission's burden in regulating sharing between the services.

SkyBridge does not oppose rules that would provide the Commission assurance regarding each NGSO FSS's system ability to comply with the limits prior to the start of service. What is needed is a framework that will ensure that each NGSO FSS system has the technical ability to modify its operations, if needed, in the unlikely event of

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47 Indeed, at one time, the Commission proposed a similar mechanism for ensuring MVDDS compliance with the limits for protection of DBS systems. See FNPRM, ¶ 273.

48 The Commission's decision is even inconsistent with the philosophy behind the its other rules in this proceeding, which provide substantially lesser protection to later-deployed receivers, whether NGSO FSS or MVDDS. It is not clear why the Commission followed that approach for other aspects of its rules, but went on to require existing NGSO FSS systems to cut capacity or coverage to protect even hypothetical future MVDDS receivers. While, as discussed above, SkyBridge does not agree with the Commission's approach for co-primary ubiquitous services, even if the Commission were to maintain it, its decision regarding the PFD limits is inconsistent with that philosophy.

a violation of the PFD limits into an operational MVDDS receiver. The Commission could require that each NGSO FSS system commit, as part of the licensing process, to meeting the PFD limits once in service. Depending on the technical parameters and capabilities of a particular NGSO FSS system, the Commission could request additional supporting evidence that the operator would be able to expeditiously remedy any demonstrated violations by its system. The Commission could also establish a requirement that, once a system is in operation, the licensee must demonstrate compliance with the PFD limits in response to any credible claim of a violation of those limits into identified operational MVDDS receivers. This technical showing presumably would employ computer simulations, using as input the actual system parameters being used at the time, and the actual location and pointing direction of the affected MVDDS receivers.[49] A licensee clearly must be prepared to make an appropriate demonstration of compliance to the Commission in the event of a credible claim of a rule violation.

SkyBridge therefore respectfully requests that the Commission reconsider its decision to treat the PFD limits as "hard limits." The record clearly demonstrates that the Commission's rules will cause significant harm to the viability of NGSO FSS systems, without any increase in the protection of MVDDS receivers. Instead of requiring a

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[49] Such a showing would be more specific, and therefore less subject to dispute, than the open-ended pre-operational showing required by the Commission's rules. During operation, actual parameters will be known and can be used to compute the actual PFD into a given MVDDS receiver. Pre-operation, worst-case simplifying assumptions will have to be made that will lead to an overestimation of the actual interference for most of the time and for most geographic locations, requiring NGSO FSS operators to constrain power unnecessarily, simply to demonstrate compliance with a generally meaningless regulation.

demonstration of compliance with the tighter limits prior to commencement of operations – a process which, as indicated above, will itself be enormously burdensome to both NGSO FSS applicants and the Commission – the Commission should require only the information it needs to ensure that an NGSO FSS operator has taken into account the need to comply with the limits and has equipped its system with the means to do so. Then, in the unlikely event that an MVDDS receiver is deployed in a problematic configuration, the Commission should require the NGSO FSS operator expeditiously to either demonstrate, using its actual operating parameters, that it is not violating the limits into that receiver, or take steps to reduce its PFD into that receiver.

IV. THE RULES REGARDING THE NGSO FSS SUBSCRIBER DATABASE SHOULD BE CLARIFIED.

Under the Commission's rules, each NGSO FSS operator must keep a database of its deployed receivers, and "share" this database with MVDDS operators.[50] The rules are not sufficiently clear as to how much of this information must be given to an MVDSS operator, and when.[51] It should be recognized by the Commission that a subscriber database constitutes highly proprietary commercial information under any circumstances, and that at least some MVDDS system may offer some services arguably in competition with certain NGSO FSS services. SkyBridge therefore urges the Commission

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50 Second R&O, ¶ 124; see also 47 C.F.R. § 25.139.

51 In particular, the rule states that the subscriber database must be maintained in a format "that can be readily shared with MVDDS licensees" for the purpose of determining compliance with the MVDDS transmitter spacing requirements. 47 C.F.R. § 25.139(a).

to clarify that this requirement will be construed very narrowly, to protect this confidential information.

First, it should be clarified that this database will not constitute public information, and that NGSO FSS operators may require MVDDS operators to execute an appropriate non-disclosure agreement prior to releasing any data from the database.

Second, it should be clarified that the NGSO FSS operator is not required, under any circumstances, to disclose to the MVDDS operator more information than that required under Section 25.139(b), i.e., "sufficient information from the database to enable the MVDDS license to determine whether the proposed MVDDS transmitting site meets the minimum spacing requirement."[52]

Third, MVDDS operators must be prohibited from using this information for any purpose other than the technical coordination specified in the rules adopted in the Second Report & Order.

CONCLUSION

For the above reasons, the Commission should reconsider its rules, adopted in the MO&O and Second Report & Order, for sharing among NGSO FSS/MVDDS systems in the 12.2-12.7 GHz band. These rules fail to adequately protect NGSO FSS user terminals, they unnecessarily burden NGSO FSS satellite operations, and they are therefore inconsistent with the co-primary allocation for these services.

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52 47 C.F.R. § 25.139(b).

Respectfully submitted,

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