Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 of the Commission's Rules to Allocate Spectrum and Adopt Service Rules and Procedures to Govern the Use of Vehicle-Mounted Earth Stations in Certain Frequency Bands Allocated to the Fixed-Satellite Service	)	IB Docket No. 07-101
	)	
Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands	)	IB Docket No. 02-10

To: The Commission

REPLY OF THE BOEING COMPANY

The Boeing Company ("Boeing"), by its attorneys and pursuant to Section 1.429(g) of the Commission's Rules, 47 C.F.R. § 1.429(g), hereby submits the following reply to the consolidated response of Maritime Telecommunications Network, Inc. ("MTN")[1] to the petitions for reconsideration of Boeing and ViaSat, Inc. ("ViaSat") in the above-referenced proceedings.[2] The record in this proceeding demonstrates that there

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[1] *See* Consolidated Response of Maritime Telecommunications Network, Inc., IB Docket No. 02-10 (filed Apr. 29, 2010) ("MTN ESV Response") and Consolidated Response of Maritime Telecommunications Network, Inc., IB Docket No. 07-101 (filed Apr. 29, 2010) ("MTN VMES Response").

[2] *See* Petition for Reconsideration of The Boeing Company, IB Docket No. 07-101 (filed Dec. 4, 2009) ("Boeing VMES Petition"); Petition for Reconsideration of The Boeing Company, IB Docket No. 02-10 (filed Oct. 15, 2009) ("Boeing ESV Petition"); Petition for Reconsideration of ViaSat, Inc., IB Docket No. 07-101 (filed Dec. 4, 2009) ("ViaSat VMES Petition"); and Petition for Clarification or Reconsideration of ViaSat, Inc., IB Docket No 02-10 (filed Oct. 15, 2009).

is a great deal of agreement from the commenting parties regarding changes that are necessary to make the most efficient use of Ku-band satellite spectrum to provide mobile broadband services to underserved communities.

In particular, the parties agree that aircraft-mounted earth stations ("AMES") can and should receive comparable treatment to the traditional fixed satellite service ("FSS"), earth stations on vessels ("ESV"), and vehicle-mounted earth stations ("VMES"); the Commission should clarify that N equals one for purposes of calculating 10*log(N) for variable power ESV and VMES networks; the Commission should clarify the meaning of the antenna pointing accuracy requirements for VMES terminals as requested by ViaSat; and the 100 millisecond automatic shut off is more restrictive than necessary to protect against RF exposure.

In addition, Boeing and ViaSat agree that the Commission should remove the 1 dB reduction in power required for variable power VMES networks and permit ALSAT authority for such networks. MTN opposes those positions, but does so without providing any evidence that permitting operation of VMES networks without the 1 dB reduction and with ALSAT authority would result in harmful interference to other licensees in the Ku-band.

I. The Parties Agree that AMES Should Be Recognized as a Primary Application of the FSS

Boeing asserts in its VMES petition that the Commission should recognize AMES as an application of the primary FSS in order to promote technical neutrality and protect important aeronautical mobile-satellite service ("AMSS")[3] broadband services now

[3] Currently aeronautical broadband services provided over FSS space stations are categorized as AMSS, which is part of the secondary MSS allocation in the Ku-band.

operating in the Ku-band.[4] ViaSat and the Satellite Industry Association express agreement in their comments submitted in the VMES proceeding.[5] MTN also states in its VMES Response that it is "sympathetic" to this position and that AMES services "can be provided on a compatible basis with traditional FSS, ESVs, and VMESs."[6]

MTN, however, argues that the Commission should not suspend the new VMES rules until such time as the AMES are recognized as a primary application as requested by Boeing in its VMES Petition.[7] MTN states that Boeing's concerns about harmful interference to secondary AMSS networks from VMES are unjustified.[8] MTN's efforts to address these issues are arguably irrelevant, however, because it was the Commission, not MTN, that was obligated to respond to these concerns in its VMES order. The

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Boeing has proposed making aeronautical services a primary application of the FSS, using the term AMES.

[4] *See* Boeing VMES Petition at 1-2.

[5] *See* Comments of the Satellite Industry Assoc., IB Docket No. 07-101, at note 5 (filed Aug. 17, 2007) ("SIA Comments"). ViaSat, Inc. ("ViaSat") supported this position, stating "[i]f the Commission affords VMES primary status, it should also treat AMSS as primary." *See* Comments of ViaSat, Inc., IB Docket No. 07-101, at note 7 (filed Aug. 17, 2007).

[6] MTN VMES Response at 2.

[7] *Id.* at 3.

[8] MTN also argues that Boeing failed to meet the requirements of Section 1.429(b) of the Commission's Rules in its petition because Boeing already made its arguments regarding interference to AMSS in its comments in the VMES proceeding. MTN argues that Boeing therefore relied on facts previously presented to the Commission and was not eligible to file a petition for reconsideration unless one of the conditions in Section 1.429(b)(1)-(3) was met. MTN has read Section 1.429 backwards. Section 1.429(b) actually states that "a petition for reconsideration which relies on facts which have *not* previously been presented to the Commission will be granted only under" the conditions in Section 1.429(b)(1)-(3). (emphasis added) The purpose of Section 1.429(b) is to ensure that parties can only request reconsideration of issues that have previously been considered by the Commission, except in certain circumstances.

Commission's failure to address Boeing's concerns was a violation of the requirement in the Administrative Procedure Act ("APA") that agencies consider all "relevant factors" when engaging in notice-and-comment rulemaking.[9] MTN makes no realistic attempt to dispute this fact.

Instead, MTN debates its perceptions of the significance of the interference concerns raised by Boeing in its comments and petition. Boeing's first concern was that VMES applications may not function as anticipated in all operational environments and therefore could cause harmful interference to AMSS networks. MTN responded that, even though AMSS is secondary, AMSS operators could still complain about harmful VMES transmissions if the offending VMES networks are operating outside of the applicable rules.[10]

In reality, however, it would be exceedingly difficult for the operator of a secondary AMSS network to demonstrate whether harmful interference caused by a VMES network resulted from the network operating within the confines of the Commission's Rules, or outside of the rules. In the meantime, the AMSS network would continue to receive harmful interference. In contrast, the ability of AMSS operators to locate and shut down offending VMES transmissions would be significantly greater if

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[9] In reviewing agency actions pursuant to notice-and-comment rulemaking under the APA, courts generally give substantial deference to agencies, but will intervene if the agency "failed to consider relevant factors or made a manifest error in judgment." *American Radio League, Inc. v. FCC*, 524 F.2d 227, 233 (D.C. Cir. 2008) (*quoting Consumer Electronics Association v. FCC*, 347 F.3d 291, 300 (D.C. Cir. 2003) (*citing Office of Communications Inc. of the United Church of Christ v. FCC*, 327 F.3d 1222, 1224 (D.C. Cir. 2003)). *See also* Boeing VMES Petition at 7-10.

[10] *See* MTN VMES Response at 4.

AMES were recognized as primary and thus could legitimately seek the cessation of harmful interference from co-primary networks regardless of the nature of the cause.

Similarly unpersuasive is MTN's response to Boeing's argument that FSS operators that are unable to identify the source of harmful interference caused by VMES networks could respond by requiring secondary AMSS networks to shut down. MTN claims that FSS network operators can quickly and precisely identify the source of interference.[11] Boeing disagrees. FSS network operators often face significant difficulty identifying the source of harmful interference, a problem that could be made worse by the growing use of mobile Ku-band terminals. In any event, this is a factual issue that should be raised with the FSS operators and ultimately addressed by the Commission. Again, the Commission's failure to address the issue and Boeing's other interference concerns in the VMES order was a violation of the APA and therefore a legitimate basis for Boeing's petition for reconsideration.

Finally, MTN failed to convincingly respond to Boeing's argument that ultra-small VMES terminals could prove more susceptible to harmful interference than FSS terminals, and that the VMES operators may seek to shut down adjacent secondary AMSS networks through FSS coordination agreements in order to increase protection to their VMES operations. MTN tersely responded that such a scenario was "unrealistic," claiming that FSS operators would not fail to protect their AMSS customers in such a scenario.[12]

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[11] *Id.*

[12] *Id.* at 4-5.

MTN misses the point. It is not the satellite service provider of an AMSS network that may seek to have an AMSS network shut down, it is the operator of the adjacent, potentially competing network. Although the satellite service provider for the AMSS network may provide some support in such a dispute, the service provider may be otherwise influenced by competing business and coordination priorities. Again, however, this is an issue to be addressed by FSS network operators and ultimately the Commission. From a practical standpoint, secondary services do not garner the attention from the Commission or from FSS operators that primary services do. These facts make Boeing's concern a realistic possibility.

Importantly, however, the issue of whether MTN agrees with Boeing regarding the potential severity of its interference concerns is irrelevant. The basis for Boeing's petition was not the potential for interference to secondary AMSS networks. Instead, Boeing objected to the Commission's failure to address Boeing's concerns in the VMES order. The Commission's failure was arbitrary and capricious in violation of the APA.

MTN asserts that "there is no question" that the Commission addressed Boeing's argument when it decided to leave the fate of AMES to the languishing AMSS proceeding. MTN, however, fails to cite to any paragraph of the VMES order where Boeing's concerns about interference from new VMES networks into incumbent AMSS networks was addressed. The APA does not permit an administrative agency to decide a matter on inference. The Commission's VMES order did not either directly or indirectly address Boeing's arguments about interference concerns to AMSS networks resulting from VMES operations, as required by the APA. The Commission should therefore

suspend the VMES rules until comparable rules are adopted authorizing AMES to operate on a primary basis in the Ku-band.

II. The Parties Agree That the Commission Should Clarify the Application of the 10*log(N) Rule to Variable Power VMES Networks

Boeing and ViaSat requested in their VMES petitions that the Commission clarify that N equals one when calculating the 10*log(N) rule for variable power VMES networks pursuant to new Section 25.226(a)(3)(i) of the Commission's rules.[13] Boeing also requested such clarification in its ESV petition and argued that the VMES rules and ESV rules should be harmonized.[14] MTN agreed that the two sets of rules should be parallel and that the Commission should clarify that the value of N is one for purposes of the 10*log(N) formula in Sections 25.222(a)(1) and 25.226(a)(1).[15] There is no disagreement from the parties in these proceedings on this matter and it should therefore be clarified by the Commission.

III. The Commission Should Eliminate the 1 dB Power Reduction for Variable Power VMES Networks and Permit ALSAT Authority Because No Evidence Has Been Provided That Such a Technology and Application Neutral Approach Would Cause Harmful Interference to Other Ku-Band Operations

Boeing and ViaSat demonstrated in their petitions that the required 1 db reduction in power in the rules for variable power VMES networks and preclusion of ALSAT authority is unnecessary.[16] Further, these restrictions inhibit innovative network management approaches designed to use the spectrum most efficiently to provide mobile

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[13] *See* Boeing VMES Petition at 13-14 and ViaSat VMES Petition at 11-12.

[14] *See* Boeing ESV Petition at 8-11.

[15] *See* MTN VMES Response at 5-6 and MTN ESV Response at 2-3.

[16] *See* Boeing VMES Petition at 10-13 and ViaSat VMES Petition at 6-14.

broadband services to unserved and underserved customers.[17] MTN was the only party to disagree, but it did not provide any reason that it believes harmful interference would result. In fact, MTN agreed that "ViaSat may be correct regarding the risk of harmful interference from CDMA VMES systems" but argued in favor of waiting to see how such networks will operate.[18]

There is no reason to wait to make full and efficient use of the Ku-band spectrum, especially with the current focus on utilizing all available spectrum for mobile broadband applications. Boeing has successfully provided dynamic power CDMA-based mobile broadband service to aircraft for many years without complaints of harmful interference. The capabilities of the technology have been adequately demonstrated during its many years of interference-free operations. The Commission should therefore permit ALSAT authority for variable power VMES networks and modify Section 25.226(a)(3)(i) of the VMES rules to remove the 1 dB reduction in power.

IV. The Parties Agree That the Commission Should Clarify the Antenna Pointing Error Rules As Requested by ViaSat and That the 100 Millisecond Shut Down Requirement is Overly Restrictive

Boeing supports ViaSat's request in its ESV and VMES petitions that the Commission clarify the antenna pointing requirements in the VMES rules and revised ESV rules.[19] Boeing also agrees with MTN that the Commission should be careful to

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[17] *Id.*

[18] MTN VMES Response at 6.

[19] Specifically, ViaSat requests that the Commission clarify that,

> (i) the default 0.2 degree pointing tolerance is a *peak* (rather than maximum level; (ii) applicants must specify both peak pointing tolerance and *maximum* mispointing levels; (iii) the pointing tolerances specified in

modify all necessary rules to implement the clarification so as not to cause further confusion.[20] On this issue the parties agree and there has been no objection.

Further, Boeing and MTN agree with ViaSat that the 100 millisecond shut down requirement in Section 25.226(a)(9) of the VMES rules is overly restrictive.[21] ViaSat has provided compelling evidence that the Commission's general RF exposure limits would be sufficient to protect operators and the public. Again, since there has been no opposition, the Commission should modify the rules as proposed by ViaSat.

V. Conclusion

Boeing commends the Commission's efforts to modify its ESV rules and establish rules for VMES networks. The parties to this proceeding agree, however, that at the same time the Commission should recognize AMES as a primary application of the FSS. Boeing urges the Commission to do so before VMES networks are permitted to come into operation. Further, the parties agree that the Commission should clarify the value of N in the 10*log(N) calculation for variable power VMES networks, clarify the antenna pointing accuracy requirements and remove the 100 millisecond shut down requirement for loss of the downlink signal.

> the rules encompass both deliberate and non-deliberate antenna misorientation away from the target satellite; and (iv) ESV [or VMES] operators may specify pointing tolerances that vary from the default values and exceed the OAED mask—provided that the combined effect has been coordinated with adjacent satellite operators.

ViaSat ESV Petition at 2 and ViaSat VMES Petition at 17-18.

[20] *See* MTN VMES Response at 7-8.

[21] *See id.* at 8.

Further, Boeing and ViaSat agree that the Commission should remove the 1 dB reduction in power for variable power VMES networks and permit ALSAT authority. No party has demonstrated that such a reduction in power or the preclusion of ALSAT authority is necessary to protect other Ku-band services from harmful interference.

Respectfully submitted,

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Certificate of Service

I, Joshua T. Guyan, hereby certify that on this 12th day of May, 2010, I caused a copy of the Reply of The Boeing Company to be served via U.S. first class mail on the party listed below.

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