

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Comprehensive Review of Licensing and) IB Docket No. 12-267
Operating Rules for Satellite Services)
)

REPLY COMMENTS OF VIASAT, INC.

ViaSat, Inc. (“ViaSat”) replies to certain comments filed in connection with the Commission’s Further Notice of Proposed Rulemaking on Part 25.¹ ViaSat supports the proposal by Kymeta Corporation (“Kymeta”) to remove the “wings” from the current Section 25.138(a) off-axis EIRP density mask on the off-axis angles between 19.1° and 48° from the main beam to allow greater flexibility for new antenna technologies without adversely impacting the interference environment in the Ka band. However, ViaSat opposes Kymeta’s proposal to enable routine processing based on an average off-axis EIRP for all angles beyond 19.1° because such an approach would not adequately protect individual systems, but at the same time diminish the benefits of added flexibility in the proposed relaxation of the Section 25.138(a) off-axis EIRP density mask. ViaSat also opposes proposals to specify a minimum antenna diameter as a threshold for routine licensing of Ka band terminals. Such an approach is unnecessary given the broad flexibility for antennas of any size under the current rules. In addition, ViaSat supports those commenters who urge the Commission to retain the two-degree spacing policy, and urges the Commission to maintain the existing policy in its entirety. Continuing to require non-

¹ *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Further Notice of Proposed Rulemaking, FCC 14-142 (rel. Sept. 30, 2014) (“*Further Notice*”).

conforming operations to protect future systems that comply with the two-degree spacing parameters would afford certainty about the minimum technical operating parameters that apply to all operators, including new entrants.

I. VIASAT SUPPORTS CERTAIN MODIFICATIONS TO THE KA-BAND OFF-AXIS EIRP DENSITY MASK THAT WOULD FACILITATE NEW ANTENNA TECHNOLOGIES

In its Comments, Kymeta proposes an alternative off-axis EIRP density mask for the Ka-band that would allow routine licensing of flat panel phased array antennas,² which antennas are characterized by sidelobes at wide angular ranges that often are larger than those of parabolic antennas.³ This proposal would serve as an alternative to, and not a replacement for, the current routine processing procedures in Section 25.138.

Kymeta notes that the current Section 25.138(a) power spectral density off-axis mask is based on the pattern of a parabolic antenna and is consistent with the natural shape of a radiated pattern produced by a typical parabolic reflector antenna.⁴ Therefore, the current mask is characterized by a steep drop between 19.1° and 48.° Kymeta’s proposed alternative mask would allow relatively higher peak far-field sidelobes and flatten out the limit to eliminate these steep reductions, or “wings,” in the power spectral density limit for these off-axis angles.⁵ Kymeta also proposes that the average sidelobe power spectral density over the entire region beyond 19.1° from the main beam not exceed -10 dBW/MHz.⁶

² Comments of Kymeta Corporation, IB Docket No. 12-267 at 7-8 (filed Jan. 29, 2015) (“Kymeta Comments”); *see also Further Notice* ¶ 106.

³ Kymeta Comments at 7.

⁴ *See id.* at 4.

⁵ *Id.* at 8; *see also id.* at Exhibit 2 at 2.

⁶ *Id.* at 8.

ViaSat supports the part of Kymeta’s proposal that eliminates the steep reduction in maximum power spectral density, or the “wings,” between 19.1° and 48° because removing those wings would allow greater flexibility for new antenna technologies without adversely affecting the interference environment.⁷ In fact, ViaSat recommends that the Commission modify the existing Ka-band off-axis EIRP density mask in Section 25.138(a) in this manner, rather than to adopt an alternative mask. The flexibility of this revised mask would facilitate a wide range of antenna technologies, not just flat panel antennas.

However, ViaSat opposes the part of Kymeta’s proposal that would specify an average power spectral density for the entire region beyond 19.1° to -10 dBW/MHz. Employing an average power spectral density level over a wide angular range ignores the potential impact of a sidelobe “spike” that far exceeds the mask on an adjacent satellite at that particular angular location, even if the average over the broader range is below a specified level. Thus, such an approach would be ineffective in protecting individual satellite networks. At the same time, Kymeta’s proposed average power spectral density level is unnecessarily constraining. As demonstrated in Kymeta’s own analysis, the off-axis power spectral density “wings” in the Section 25.138(a) can be removed without adversely affecting the interference environment, and without adopting an average level across the off-axis angles beyond 19.1°. Applying an average power spectral density level based on these “wings” that should be removed would be unduly limiting and thus diminish the benefits of added flexibility in the proposed relaxation of the Section 25.138(a) off-axis EIRP density mask. Therefore, ViaSat urges the Commission to refrain from adopting such an average level, even as part of an alternative to the existing Section 25.138 mask.

⁷ See *id.* at Exhibit 2.

II. THE COMMISSION SHOULD NOT IMPOSE A MINIMUM ANTENNA SIZE FOR ROUTINE LICENSING AT KA BAND

ViaSat opposes the recommendation of AvL Technologies, Inc. (“AvL”) to adopt a minimum equivalent antenna diameter of 60 cm to qualify for routine licensing in the Ka band.⁸ In its comments, AvL responds to the Commission’s proposal in the *Further Notice* to prescribe a minimum antenna diameter of 66 cm for routine licensing of 20/30 GHz earth stations that comply with certain off-axis antenna gain and maximum input power density levels.⁹

As the Commission has already recognized, imposing a minimum antenna size on routine processing unduly restrains the deployment of new antenna technologies that may rely on antenna diameters that are smaller than a specified size.¹⁰ In adopting the rules for routinely processing Ka-band earth stations, the Commission specifically moved away from the approach historically taken in the C- and Ku-band context, which established a minimum antenna size and prescribed certain power levels.¹¹ Instead, in order to facilitate innovation in antenna technologies and the deployment of smaller aperture antennas, which are less expensive and easier to install, the Commission adopted an off-axis power spectral density envelope that represents a composite of the antenna gain pattern and maximum power levels. This composite allows a “power-pattern tradeoff,” providing operators flexibility to decrease their power levels

⁸ See Comments of AvL Technologies, Inc., IB Docket No. 12-267 at 2 (filed Jan. 28, 2015).

⁹ *Further Notice* ¶ 81.

¹⁰ See *2000 Biennial Regulatory Review – Streamlining and Other Revisions of Part 25 of the Commission’s Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations*, Fifth Report and Order, 20 FCC Rcd 5666 ¶ 12 (2005) (“*Licensing Reform Fifth Report and Order*”).

¹¹ See *Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite Service Use*, Report and Order, 15 FCC Rcd 13430 ¶¶ 90-91 (2000).

to compensate for smaller earth station antennas that may not conform to a stated antenna gain pattern.¹² After adopting such rules in the Ka band, the Commission extended this approach to provide the same flexibility in the C and Ku bands.¹³

In reliance on this “power-pattern” trade off, the industry has developed a wide variety of antenna technologies, and the Commission has routinely licensed hundreds of thousands of antennas for over a decade without regard to a minimum antenna diameter.¹⁴ And, the existing rule has provided flexibility to deploy new antenna technologies without adversely affecting the interference environment.

Adopting a minimum antenna size as a threshold for licensing, even as an alternative application procedure, could create the impression that antennas with a diameter smaller than the minimum are not “routine,” resulting in additional review and delays in processing. Thus, establishing a minimum antenna threshold for routine processing would inject unnecessary complexity into the rules and would represent a dramatic step backward from the flexibility afforded by the approach reflected in the current rules. Therefore, ViaSat urges that the Commission refrain from establishing a minimum antenna diameter for routine processing of Ka-band earth stations.

¹² See *Licensing Reform Fifth Report and Order* ¶ 12 (adopting an off-axis power spectral density envelope for routine licensing of C- and Ku-band antennas, modeled on the approach adopted for blanket licensed terminals in the Ka band).

¹³ *Id.* ¶ 42.

¹⁴ See, e.g., ViaSat, Inc. IBFS File No. SES-LIC-20101217-01585, Call Sign E100143 (granted Oct. 20, 2011); HNS License Sub, LLC, IBFS File No. SES-LIC-20061226-02232, Call Sign E060445 (granted Feb. 27, 2007).

III. VIASAT SUPPORTS RETAINING THE COMMISSION'S TWO-DEGREE SPACING POLICY

ViaSat agrees with commenters who support maintaining the two-degree spacing policy, under which the Commission routinely licenses satellite network operations conforming to predetermined technical criteria for two-degree spacing compatibility, without requiring coordination or interference analysis.¹⁵ Under the current policy, an operator proposing to exceed these routine limits must certify that it has coordinated the proposed non-conforming operations with co-frequency adjacent systems and that it will operate in compliance with such coordination agreements. The operator must also coordinate such non-conforming operations with subsequent systems within six degrees, or reduce power to the extent necessary to reduce off-axis EIRP density to levels within routine limits, and accept any interference from neighboring two-degree compliant operations, if a coordination agreement cannot be reached.¹⁶

DIRECTV, SES and EchoStar each urge the Commission to maintain the two-degree spacing policy.¹⁷ ViaSat agrees that the policy enables expedited and efficient application processing and reduced application burdens by eliminating the need for detailed interference analyses through the establishment of “pre-coordinated” levels that assume a two-degree spaced interference environment.¹⁸ This policy is consistent with the primary goals of this proceeding, which are to streamline licensing procedures and to minimize administrative burdens.

¹⁵ *Further Notice* ¶ 44

¹⁶ *See* 47 C.F.R. §§ 25.138(c), 25.220(d)(2), 25.221(a)(2), 25.222(a)(2), 25.226(a)(2), 25.227(a)(2).

¹⁷ Comments of DIRECTV, LLC, IB Docket No. 12-267 at 6 (filed Jan. 29, 2015) (“DIRECTV Comments”); Joint Comments of SES Americom, Inc. and New Skies Satellites B.V., IB Docket No. 12-267 at 3 (filed Jan. 29, 2015) (“SES Comments”); Comments of EchoStar Satellite Operating Corporation and Hughes Network Systems, IB Docket No. 12-267 at 30 (filed Jan. 29, 2015) (“EchoStar Comments”).

¹⁸ *See* SES Comments at 4; EchoStar Comments at 30.

In contrast, Intelsat is the lone voice seeking to eliminate the two-degree spacing policy, arguing that it undermines the ITU priority regime and disadvantages U.S. licensees by restraining operations to two-degree spaced technical parameters.¹⁹ Intelsat acknowledges that the policy contemplates that any non-two-degree operations could be coordinated with adjacent operators but argues that the policy is no longer necessary or useful because it asserts that “space station applicants routinely ‘deviate’” from two-degree spaced parameters.²⁰ ViaSat disagrees. Two-degree spacing is a cornerstone of Commission policy that has enabled a stable operating environment for both existing and new system operations, and the industry has invested billions of dollars in reliance on a well-established, two-degree spaced environment. Eliminating the long-standing policy could result in non-conforming incumbent operations precluding new entrants from commencing operations, which is an increasing risk as the GSO arc becomes saturated. Further, Intelsat’s stated concerns regarding perceived disadvantages to U.S. licensed systems when negotiating coordination agreements with non-U.S. systems that do not serve the United States (and thus are not subject to the two-degree spacing policy) do not warrant elimination of the policy altogether. Such concerns instead would be better dealt with on a case-by-case basis through exceptions to the policy for such operations.

Moreover, ViaSat agrees with DIRECTV and SES that the two-degree spacing policy provides certainty to all operators that, regardless of when they commence operations, they can be assured that they are entitled to operate up to the parameters permitted under the policy.²¹ In this respect, ViaSat urges the Commission to continue to require non-conforming operations to

¹⁹ See Comments of Intelsat License LLC, IB Docket No. 12-267 at 22-23 (filed Jan. 29, 2015).

²⁰ *Id.* at 20.

²¹ See DIRECTV Comments at 7; SES Comments at 8.

