

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

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In the Matter of )	
)	
<b>VIASAT, INC.</b> )	Call Sign: E170088
)	
Application for Blanket Earth Station )	File No. SES-LIC-20170401-00357
License Using Ka-band Spectrum )	
_____ )	

**COMMENTS OF SPACE EXPLORATION HOLDINGS, LLC**

Space Exploration Holdings, LLC (“SpaceX”) hereby comments on the application filed by ViaSat, Inc. (“ViaSat”) for a blanket license to deploy four million 0.75 meter and ten thousand 1.8 meter fixed earth stations throughout the United States, which will operate at higher peak power levels than previously authorized. Among the frequency bands ViaSat proposes to use for its earth station communications with two of its geostationary satellite orbit (“GSO”) space stations are 18.8-19.3 GHz and 28.6-29.1 GHz – both of which the Commission has designated for non-geostationary satellite orbit (“NGSO”) operations on a primary basis. As an applicant in the ongoing NGSO processing round for Ku/Ka-band spectrum,<sup>1</sup> SpaceX is concerned that the increase in power ViaSat proposes for transmissions in the latter band may adversely affect NGSO systems. Accordingly, it requests that the Commission require that ViaSat demonstrate that its proposed operations in the 28.6-29.1 GHz band will not cause harmful interference to NGSO systems as a prerequisite to granting the application.

<sup>1</sup> See Public Notice, Applications Accepted for Filing, DA 17-524 (IB, rel. May 26, 2017).

ViaSat currently operates a version of the 0.75 meter earth station at issue in this proceeding in the NGSO bands, under call sign E100143. However, the proposed antenna would operate at a higher peak power level. ViaSat asserts that, “while the peak burst power is higher, when duty cycle is taken into account, the average power is the same or lower than the previous model,” and accordingly concludes that “[n]othing in this application adversely affects any of the technical analysis underlying ViaSat’s existing authority to communicate with the specified satellite points of communication over the requested band segments.”<sup>2</sup>

At the outset, SpaceX would note that nothing in ViaSat’s previous analysis related to use of the 1.8 meter antenna, or to communications with ViaSat-2. Even putting these issues aside, while ViaSat’s analysis may be correct with respect to an individual 0.75 meter earth station, it is misleading as applied to such earth stations in the aggregate. Essentially, ViaSat proposes to reduce the duty cycle and increase the power of transmissions for each earth station. This will enable ViaSat to allow more earth stations to share the same uplink spectrum. For any given earth station, the reduction in duty cycle could effectively offset the increase in power, on average over time. However, because other earth stations will step in to use the spectrum made available by the reduced duty cycle, the aggregate effect will be a significant increase in the power at which ViaSat’s earth station network transmits to its satellites.

The gateway earth stations SpaceX proposes to operate in the 28.6-29.1 GHz band will transmit at an EIRP density of slightly less than 0 dBW/4kHz. By comparison, ViaSat proposes to transmit at an EIRP density of up to 26.59 dBW/4kHz (for the 0.75

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<sup>2</sup> Application Narrative at 2. No previous version of the 1.8 meter earth station has been authorized. However, it will use the same transmit and receive integrated assembly as the 0.75 meter earth stations. *Id.*

meter antenna) and 34.27 dBW/4kHz (for the 1.8 meter antenna). With this significant disparity, the receivers on SpaceX's NGSO satellites would suffer noticeable desense whenever they happen to cross the main beam of a ViaSat earth station. Given that ViaSat seeks authority to deploy over four million of these earth stations across the United States to communicate with satellites at two different orbital locations, the potential for frequent interference events is high.

As reassurance that its proposed operations will not result in harmful interference, ViaSat notes that ViaSat-1 has been operating successfully for over six years in the 28.6-29.1 GHz band on a secondary basis with respect to NGSO operations.<sup>3</sup> However, ViaSat has a total of approximately 659,000 consumer and small business subscribers<sup>4</sup> and is seeking authority for over 4,000,000 new earth stations. In addition, the current application seeks authority for communications with both ViaSat-1 and ViaSat-2. These two factors significantly increase the opportunities for interference. Moreover, at present, there is only one NGSO system operating in the 28.6-29.1 GHz band (O3b), with a limited number of equatorial mid-Earth orbit satellites that began operation less than four years ago.<sup>5</sup> That is likely to change in the near future, however, after the Commission completes consideration of the applications pending in the current NGSO processing round. Those applications propose operation of many thousands of NGSO satellites at much lower altitudes and with a greater dispersion of orbital patterns. Accordingly,

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<sup>3</sup> *Id.* It is worth noting that, according to ViaSat's most recent annual report filed with the Securities and Exchange Commission, ViaSat-1 "was placed into service in January 2012" – or just over *five* years ago. See ViaSat, Inc., Form 10-K for the fiscal year ending March 31, 2017, at 3, *available at* <http://investors.viasat.com/secfiling.cfm?filingID=1193125-17-182146&CIK=797721> ("ViaSat Annual Report").

<sup>4</sup> See ViaSat Annual Report at 4.

<sup>5</sup> See IBFS File No. SAT-LOI-20141029-00118 (describing O3b deployment of four NGSO satellites each in June 2013, July 2014, and December 2014).

ViaSat's historical ability to coexist with NGSO operations is little comfort that its proposed operations would be able to do so going forward.

NGSO satellite systems such as the one proposed by SpaceX promise to revolutionize the ability to provide high-capacity, low-latency satellite broadband services to customers throughout the United States and the world, including in remote and otherwise underserved areas. The Commission has only designated two bands (18.8-19.3 GHz and 28.6-29.1 GHz) for use by NGSO systems on a primary basis. If it allows GSO systems to compromise that spectrum, the Commission will undermine the next step in satellite broadband innovation before it can even get started. The authorizations issued for ViaSat-1 and ViaSat-2, as well as the existing blanket earth station license, all include provisions requiring that ViaSat's operations not cause harmful interference to any system authorized to operate on a primary basis in the 28.6-29.1 GHz band.<sup>6</sup> SpaceX requests that the Commission require ViaSat to demonstrate that its proposed operations in the 28.6-29.1 GHz band will satisfy these conditions with respect to NGSO systems, such as the one proposed by SpaceX.

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<sup>6</sup> See Radio Station Authorization, IBFS File No. SES-LIC-20101217-01585, Special Provision 9970 (Oct. 20, 2011); ViaSat-1 Authorization, IBFS File No. SAT-LOI-20080107-00006, Attachment at preamble (Aug. 18, 2009); ViaSat-2 Authorization, IBFS File No. SAT-LOI-20130319-00040, Attachment at ¶ 9 (Dec. 12, 2013).

Respectfully submitted,

SPACE EXPLORATION TECHNOLOGIES CORP.

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June 2, 2017

## ENGINEERING CERTIFICATION

The undersigned hereby certifies to the Federal Communications Commission as follows:

- (i) I am the technically qualified person responsible for the engineering information contained in the foregoing Comments,
- (ii) I am familiar with Part 25 of the Commission's Rules, and
- (iii) I have either prepared or reviewed the engineering information contained in the foregoing Comments, and it is complete and accurate to the best of my knowledge and belief.

Signed:

*/s/ Mihai Albulet*

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Mihai Albulet, PhD  
Principal RF Engineer  
SPACE EXPLORATION TECHNOLOGIES CORP.

June 2, 2017

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Date

**CERTIFICATE OF SERVICE**

I hereby certify that, on this 2<sup>nd</sup> day of June, 2017, a copy of the foregoing Comments was served via electronic mail and First Class mail upon:

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/s/ Sabrina McMillin  
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