

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
ViaSat, Inc.)
)
NGSO-Like Satellite Applications and)
Petitions for U.S. Market Access in the) SAT-PDR-20161115-00120
12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-) Call Sign S2985
18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5)
GHz Bands)

To: Chief, International Bureau

**RESPONSE OF
THE BOEING COMPANY**

The Boeing Company (“Boeing”), by its attorneys, hereby responds to certain of the comments addressing the market access application of ViaSat, Inc. (“ViaSat”) to launch and operate a non-geostationary satellite orbit (“NGSO”) system operating in the fixed satellite service (“FSS”) in portions of the Ka-band.¹ As a leader in the global aerospace and satellite communications industries, Boeing supports measures that advance the entire satellite communications industry. To this end, Boeing urges the Commission to conditionally approve ViaSat’s proposal to operate inter-satellite links (“ISLs”) in portions of the Ka-band. Such an approval would recognize the substantial public interest benefits that could be achieved by authorizing ISL communications between NGSO satellites in lower orbits and geostationary satellite orbit (“GSO”) spacecraft in high orbit.

¹ Although ViaSat has also requested authority to operate its NGSO FSS system in portions of the V-band, those portions of ViaSat’s application have not yet been accepted for filing by the Commission.

The ability to route NGSO ISL communications through GSO satellites would enable data to be delivered directly to a remote ground terminal that is not in view of the lower orbit NGSO satellite. This network architecture would expand the ability of NGSO satellites in lower orbits to provide data directly to the public switched network and Internet backbone from remote points across the globe. It would also resolve the significant problem of efficiently using low earth orbit (“LEO”) satellites while they traverse oceans outside the reach of ground earth stations on distant continents. The transmission path to a GSO satellite would enable the network operator to keep LEO satellites in continual use, providing broadband services to very remote regions and the still-underserved maritime and aviation industries.

Hughes and Inmarsat have separately filed oppositions to ViaSat’s application and its use of ISLs within FSS allocations. Both Hughes and Inmarsat, however, acknowledge that the definition of FSS does include satellite-to-satellite links.² Therefore, Inmarsat is incorrect in arguing that ViaSat’s proposal would constitute a non-conforming use of FSS spectrum.³ Inmarsat argues that ViaSat has failed to provide analysis on whether “a transmitter operating on a MEO satellite at an orbit of 8200 km . . . will cause the same impact to other GSO satellite as if the transmitter was on the Earth.”⁴ Inmarsat further states that a transmitter on a MEO satellite “would result in a time varying and very different interference geometry” than that offered by earth stations or even airborne users.⁵ Hughes makes a similar assertion that “there are no studies

² See Comments of Hughes Network Systems, LLC in Response to DA 17-524, at unnumbered page 3 (June 26, 2017) (“*Hughes Comments*”); Petition to Deny of Inmarsat, IBFS File No. SAT-PDR-20161115-00120 (“June 26, 2017”) (“*Inmarsat Petition*”).

³ See *Inmarsat Petition* at 3.

⁴ *Inmarsat Petition* at 3-4.

⁵ *Id.*

or technical references that support the generic use of FSS allocations, including in the Ka-band, for inter-satellite communications.”⁶

Although Boeing is sympathetic to these comments regarding the apparent lack of data submitted by ViaSat, this does not necessarily constitute grounds for denying ViaSat’s market access application. A LEO or MEO satellite communicating to a GSO spacecraft while operating within the nominal coverage “disk” of the GSO space station (*i.e.*, within 8.2 degrees of the GSO “relay” sub-satellite nadir point for an equivalent to 20-degree elevation angle as viewed from the ground) would be able to do so using the same earth station pointing and off axis transmission requirements that exist for earth stations at fixed locations or on mobile platforms. In principle, no additional interference would be received by adjacent GSO satellites. If, however, ViaSat proposes ISL operations outside the nominal GSO earth coverage “disk”, data regarding such proposed operations and its interference potential would need to be presented or incorporated within an interference analyses for such operations.

Several remedies are available to the Commission that would enable the prompt grant of ViaSat’s application, including: i) requesting additional detail on the potential impact of ISL operations with GSO space stations; ii) including ISL operations within EPFD_{up} and EPFD_{down} calculations to limit potential interference; and/or iii) formally requiring ViaSat to complete coordination of its ISLs with potentially affected GSO operators as a condition of the grant of its market access authorization. The Commission may also request additional comment and analysis

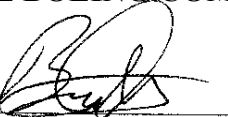
⁶ *Hughes Comments* at 3.

on the use of FSS allocations for NGSO-to-GSO ISLs within the on-going NGSO rulemaking proceeding by issuing a supplemental public notice in that proceeding.⁷

Therefore, Boeing recommends that the Commission allow the ViaSat market access application to proceed inclusive of its proposed use of NGSO-to-GSO ISLs within FSS spectrum, with the market access grant being conditioned on one of the several possible alternatives presented above. Such a grant serves the important public interest benefits of authorizing ISLs between spacecraft in GSO and lower orbits, while imposing those conditions that may be necessary to limit any potential interference that would result to existing GSO communications services.

Respectfully submitted,

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⁷ See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters, IB Docket No 16-408, *Notice of Proposed Rulemaking*, FCC 16-170 (Dec. 15, 2016).

CERTIFICATE OF SERVICE

I, Bruce A. Olcott, hereby certify that on July 7, 2017, I caused a copy of the foregoing Response of The Boeing Company to be served by U.S. first-class mail, postage paid, upon each of the following:

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