

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

In the Matter of	)	
	)	
ViaSat, Inc.	)	SAT-PDR-20161115-00120
	)	
Application for U.S. Market Access	)	

**PETITION TO DENY OF INMARSAT**

Inmarsat, Inc. (“Inmarsat”) submits the following Petition to Deny in response to the Federal Communication Commission’s (“Commission” or “FCC”) Public Notice regarding ViaSat, Inc.’s (“ViaSat”) petition seeking access to the United States for a non-geostationary (“NGSO”) Fixed-Satellite Service (“FSS”) satellite network involving a constellation of 24 satellites operating in medium earth orbit (“MEO”).<sup>1</sup> ViaSat requests to use 27.5-29.1 GHz and 29.5-30.0 GHz FSS “uplink” spectrum and 17.8-19.3 GHz and 19.7-20.2 GHz FSS “downlink” spectrum for inter-satellite links.<sup>2</sup> This proposed operation of inter-satellite links has the potential to cause harmful interference to other satellite operators. Inmarsat urges the Commission to deny ViaSat’s request to use the requested bands for inter-satellite links.

Inmarsat is the leader in global mobile satellite communications, operating a global system of 13 satellites and associated ground infrastructure that offers a wide range of communications solutions to customers on land, in the air, and at sea. Inmarsat’s Global Xpress

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<sup>1</sup> *Satellite Policy Branch Information; Applications Accepted for Filing; Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5 GHz Bands*, Public Notice; DA 17-524 (May 26, 2017) (“Notice”).

<sup>2</sup> *See* ViaSat, Petition for Declaratory Ruling Granting Access to the U.S. for a Non-U.S.-Licensed Nongeostationary Orbit Satellite Network, SAT-PDR-20161115-00120 at 5-6 (filed Nov. 15, 2016) (“ViaSat Petition”).

broadband satellite service uses the Ka-band to deliver data speeds of up to 50 Mbps to the most remote and inaccessible locations of the world, and along nearly every point of many long-haul aviation and maritime routes that currently lack high-speed connectivity. Global Xpress is the result of a \$1.6 billion investment that included the launch of four high-bandwidth satellites, and the construction of an earth station in Lino Lakes, Minnesota. Inmarsat also operates mobile satellite services supporting critical communications applications requiring up to 99.999% availability. Inmarsat's global system allows customers across the aviation, maritime, enterprise and government sectors to have reliable and assured access to high-throughput communications including voice, mobile broadband, connected car, Internet of Things, smart society, safety-of-life, and emergency communications applications. Inmarsat's Global Xpress satellites operate in the 17.7-20.2 GHz and 27.5-30.0 GHz bands that overlap with some of the bands ViaSat proposes to use.

ViaSat requests market access in the 17.8-18.6 GHz and 18.8-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30.0 GHz (Earth-to-space) frequency bands to provide FSS to end users and seeks to use these same frequency bands for inter-satellite links between the proposed ViaSat MEO NGSO satellites and its in-orbit GSO satellites.<sup>3</sup> Inmarsat respectfully requests that the Commission deny ViaSat's request to use Ka-band spectrum for inter-satellite links as ViaSat has not provided any demonstration that these proposed operations will be compatible with GSO FSS networks.

ViaSat asserts that operation of satellite-to-satellite links between the proposed MEO satellites and ViaSat's GSO satellites is consistent with the definition of FSS. Although the

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<sup>3</sup> ViaSat Petition at 5.

Commission's definition of FSS contemplates "in some cases" inter-satellite links,<sup>4</sup> the Ka-band FSS allocations are designated for space-to-Earth or Earth-to space communications, not for space-to-space. Inter-satellite links have the potential to cause interference to other satellite networks. Even ViaSat acknowledges that operation of these links may not be contemplated by the Commission's rules.<sup>5</sup>

ViaSat's inter-satellite link proposal is a "non-conforming use" because it is inconsistent with the Ka-band allocations in the U.S. band plan. The Commission requires an applicant proposing a non-conforming use to demonstrate it will not interfere with authorized services and must accept any interference it will receive from authorized services.<sup>6</sup> ViaSat in its Application does not provide or address the showing required for authorization of non-conforming uses.

Indeed, ViaSat fails to provide analysis that would provide any assurance to the Commission or GSO FSS operators that the MEO-to-GSO link would not cause interference to other GSO networks licensed to provide service to the U.S. or other countries. ViaSat asserts that by the MEO-to-GSO transmission complying with the FCC off-axis EIRP density mask in Section 25.138 (a)(1)<sup>7</sup> and by ensuring that the 3-sigma antenna pointing error is less than 0.2 degrees, compatibility in a 2 degree GSO spacing environment is assured. However, no analysis is provided on whether a transmitter operating on a MEO satellite at an orbit of 8200 km, as in

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<sup>4</sup> 47 C.F.R. §§ 2.1, 25.103.

<sup>5</sup> ViaSat Petition at n. 6 ("To the extent the Commission nevertheless concludes that operation of such links is not currently contemplated by its rules, ViaSat requests a waiver to permit operation of the proposed satellite-to-satellite links.")

<sup>6</sup> See, e.g. *Application of Fugro-Chance, Inc.*, Order and Authorization, 10 FCC Rcd 2860, ¶ 2 (IB 1995). See also *Hughes Network Systems, LLC*, Declaratory Ruling, 26 FCC Rcd 8521 at n. 1, ¶¶ 12-14 (IB 2011); *Boeing Company*, Order and Authorization, 16 FCC Rcd 5864, ¶¶ 8-9, 11 (IB and OET 2001).

<sup>7</sup> ViaSat seems to propose to only meet the off-axis EIRP limits specified in 25.138(a)(1) for co-polarized signals in the plane tangent to the GSO arc and does not address the other off-axis EIRP limits contained in Section 25.138.

the ViaSat proposal, will cause the same impact to other GSO satellite as if the transmitter was on the Earth. While the Commission is considering permitting operation of earth stations on aircraft in the Ka-bands,<sup>8</sup> aircraft typically have a cruising altitude of 9 to 12 km, which has a minimal effect on the impact to other GSO satellites compared to the same transmitter on the Earth's surface. A transmitter on a MEO satellite would result in a time varying and very different interference geometry, which should be carefully studied to ensure that GSO satellite operations are not affected.

Further, the bands where ViaSat proposes to operate satellite-to-satellite links are highly utilized by GSO FSS satellites which stand to be joined soon by a plethora of NGSO FSS satellites. This heavy level of use creates a contested interference environment. ViaSat itself has raised concerns that the current equivalent power-flux density ("EPFD") limits, which were adopted 20 years ago, may not be sufficient to protect current and future GSO FSS satellites.<sup>9</sup> Introducing new sources of interference from NGSO-satellite-to-GSO-satellite transmissions would only exacerbate the potential for interference to GSO FSS satellites.

Any new use of the Ka-band for NGSO-to-GSO links needs to be carefully studied to determine if such use will impact existing services both on a single entry and aggregate basis. It would be naïve to assume that the proposed ViaSat NGSO system will be the only NGSO system which will seek to communicate with GSO space stations. Since no such analysis has been provided, the Commission should deny ViaSat's application for inter-satellite links in the Ka-band FSS spectrum.

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<sup>8</sup> *Amendment of Parts 2 and 25 of the Commission's Rules to Facilitate the Use of Earth Stations in Motion Communicating with Geostationary Orbit Space Stations in Frequency Bands Allocated to the Fixed Satellite Service*, Notice of Proposed Rulemaking, IB Docket No. 17-95, FCC 17-56 (May 19, 2017).

<sup>9</sup> *See* ViaSat Comments, IB Docket No. 16-408 at 11 (filed Feb. 27, 2017).

Finally, as the Commission has recognized, grants of NGSO applications must be conditioned on the outcome of the FCC’s pending NGSO Rulemaking.<sup>10</sup> As the Commission is aware, there are several sets of NGSO EPFD limits that apply in the bands requested by ViaSat, including single entry validation and operational limits that must be met by individual NGSO FSS systems, as well as limits that must be met by all NGSO FSS systems in aggregate. Inmarsat filed detailed comments in the NGSO Rulemaking urging the Commission to create a mechanism to ensure that aggregate EPFD limits will be met by all NGSO FSS systems licensed in a particular band.<sup>11</sup> If the Commission grants ViaSat’s petition (apart from the request to use the Ka-band for inter-satellite links, which should be denied) prior to the resolution of the NGSO proceeding, it should condition grant on the outcome of that proceeding. Taking this action is consistent with the Commission’s recent grant of market access to OneWeb.<sup>12</sup>

For the reasons provided above, Inmarsat requests that the Commission deny ViaSat’s request to use the Ka-band for inter-satellite links.

Respectfully submitted,

/s/ Giselle Creeser  
Giselle Creeser  
Director, Regulatory

Inmarsat Inc.  
1101 Connecticut Avenue, NW

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<sup>10</sup> *In re Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, IB Docket No. 16-408, FCC 16-170 (Dec. 15, 2016) (“NGSO Rulemaking”).

<sup>11</sup> Comments of Inmarsat, IB Docket No. 16-408 (filed Feb. 27, 2017); Reply Comments of Inmarsat, IB Docket No. 16-408 (filed Apr. 10, 2017). These comments and reply comments are incorporated by reference into the instant proceeding.

<sup>12</sup> *WorldVu Satellites Limited*, Order and Declaratory Ruling, IBFS File No. SAT-LOI-20160428-00041, FCC 17-77, ¶ 12 (June 23, 2017).

Suite 1200  
Washington, D.C. 20036  
Telephone: (202) 248-5150

Jennifer D. Hindin  
Katy M. Ross  
Wiley Rein LLP  
1776 K Street NW  
Washington, DC 20006  
Telephone: 202-719-4975  
*Counsel to Inmarsat*

June 26, 2017

**CERTIFICATE OF SERVICE**

I hereby certify that on June 26, 2017, I caused a true and correct copy of the foregoing Petition to Deny to be served by first class mail on the following:

Christopher J. Murphy  
Daryl T. Hunter  
Christopher Hofer  
VIASAT, INC.  
6155 El Camino Real  
Carlsbad, CA 92009-1699

John P. Janka  
Elizabeth R. Park  
Jarrett S. Taubman  
LATHAM & WATKINS LLP  
555 Eleventh Street, NW  
Washington, DC 20004

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/s/

Kim Riddick