

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of	)	
	)	
Viasat, Inc.	)	IBFS File No. SAT-MPL-20200526-00056
	)	
Modification to Authorization for	)	Call Sign S2985
VIASAT-NGSO satellite system	)	
Operating in the Ka- and V-bands	)	

**COMMENTS OF  
THE BOEING COMPANY**

The Boeing Company (“Boeing”), through its counsel and pursuant to Section 25.154 of the Commission’s rules, provides these comments on the application of Viasat, Inc. (“Viasat”) to substantially modify its previously authorized non-geostationary satellite orbit (“NGSO”) system operating in the Ka- and V-bands.<sup>1</sup> Viasat is seeking fundamental changes to its NGSO constellation, increasing the number of satellites from 20 to 288, reducing the altitude from a medium Earth orbit (“MEO”) of 8,200 kilometers to a low Earth orbit (“LEO”) of 1,300 kilometers and further concentrating its satellites through a reduction in inclination from 87° to 45° latitude.<sup>2</sup>

Boeing does not object to the grant of Viasat’s application. Boeing recommends, however, that the Commission initiate a new processing round for NGSO systems that would

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<sup>1</sup> Boeing is an applicant for authority to launch and operate an NGSO satellite system that would operating using V-band frequencies. See The Boeing Company, Application for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Fixed Satellite Service, IBFS File Nos. SAT-LOA-20170301-00028, SAT-AMD-20170929-00137 and SAT-AMD-20180131-00013 (call sign S2993) (March 1, 2017). Therefore, Boeing is directly affected by Viasat’s modification application.

<sup>2</sup> See Viasat, Inc., Modification to Authorization, IBFS File No. SAT-MPL-20200526-00056 (call sign S2985) (May 26, 2020) (“*Viasat Application*”).

operate in portions of the V-band.<sup>3</sup> The use of an additional processing round would help to protect the reasonable expectations of existing NGSO system applicants and avoid confusion regarding the spectrum sharing structure applicable to more recent applicants that have sought new or significantly modified authority to use the V-band to provide broadband communications services in the United States.

**I. THE COMMISSION SHOULD INITIATE A NEW APPLICATION PROCESSING ROUND TO ADDRESS NEW AND SIGNIFICANTLY MODIFIED NGSO SYSTEMS INVOLVING THE V-BAND**

In response to an application filed by Boeing for authority to launch an NGSO satellite system, the Commission initiated a V-band NGSO application processing round on November 1, 2016, which included an application cut-off deadline of March 1, 2017.<sup>4</sup> Applications to construct NGSO systems that would use V-band frequencies were filed by eight companies.<sup>5</sup>

Nearly four years later, additional parties have recognized the significant opportunities presented by V-band spectrum to make very high density and low latency broadband communications services available to all Americans and have requested Commission authority to operate NGSO systems using this spectrum or, in the case of Viasat, to greatly increase the density of its satellites. AST&Science LLC (“AST”) filed an application on April 13, 2020 seeking U.S. market access to launch and operate a NGSO constellation of 243 low Earth orbit (“LEO”)

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<sup>3</sup> For purposes of these comments, Boeing refers to the V-band as including the 37.5-42.0 GHz (space-to-Earth) and the 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space) frequency bands.

<sup>4</sup> See Satellite Policy Branch Information, Boeing Application Accepted for Filing in Part, IBFS File No. SAT-LOA-20160622-00058, Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz Bands, DA 16-1244, at 3 (Nov. 1, 2016).

<sup>5</sup> NGSO applications were filed by Boeing, O3b, Theia Holdings A, Inc., Audacy Corporation, Space Exploration Holdings, LLC, WorldVu Satellites Limited, Telesat Canada, and Viasat, Inc.

satellites that would operate in various frequency bands, including the V-band.<sup>6</sup> The AST application appears to be under review by the Commission to determine if it is acceptable for filing.

A second application was filed on May 26, 2020 by Mangata Networks LLC (“Mangata”) requesting U.S. market access for a constellation of 791 medium Earth orbit (“MEO”) satellites operating in both the Ka- and the V-band.<sup>7</sup> The Commission placed Mangata’s application on public notice for comment on August 7, 2020.<sup>8</sup> The public notice, however, did not indicate whether Mangata’s application was being treated as a “lead application” and whether its public notice had initiated a new processing round for NGSO systems operating in the V-band, as required by Section 25.157(c)(2) of the Commission’s rules.<sup>9</sup>

Concurrently, Viasat filed an application seeking authority for a wholesale modification to its previously authorized NGSO system. Given the significant number of new and significantly modified NGSO system applications that are now pending before the Commission, a new processing round should be initiated to distinguish the spectrum sharing regime that exists between the previous round of NGSO systems and these subsequent filings. As the Commission has explained, the purpose of its application processing rounds is to “establish a sharing environment among NGSO systems, to provide a measure of certainty in lieu of adopting an open-ended

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<sup>6</sup> See AST & Science, LLC, Petition for Declaratory Ruling, IBFS File Nos. SAT-PDR-20200413-00034 and SAT-APL-20200727-00088 (call sign S3065) (April 13, 2020).

<sup>7</sup> See Mangata Networks LLC, Petition for Declaratory Ruling, IBFS File No. SAT-PDR-20200526-00054 (call sign S3068) (May 26, 2020).

<sup>8</sup> See Satellite Policy Branch Information, Space Station Applications Accepted for Filing, Rep. No. SAT-01487 (Aug. 7, 2020).

<sup>9</sup> 47 C.F.R. § 25.157(c)(2) (explaining that “[l]ead applications that are acceptable for filing will be placed on public notice. This public notice will initiate a processing round, establish a cut-off date for competing NGSO-like satellite system applications, and provide interested parties an opportunity to file pleadings in response to the application pursuant to §25.154”).

requirement to accommodate all future applicants.”<sup>10</sup> The recently filed applications, including Viasat’s modification application, materially alter the “establish(ed) sharing environment among NGSO systems” that was bounded by the March 2017 cut-off deadline.<sup>11</sup> The Commission should therefore create a new processing round in which the sharing status of applicants is deferred “considering both the need to protect existing expectations and investments and provide for additional entry as well as any comments filed by incumbent operators and reasoning presented by the new applicant.”<sup>12</sup>

In raising this issue, Boeing acknowledges that it is too soon to determine the appropriate spectrum sharing status of NGSO system applications processed in a subsequent processing round. None of the eight applicants that participated in the 2017 processing round have yet launched their V-band systems and thus we do not yet know how many will be launched and whether the V-band will be able to accommodate additional NGSO constellations. Nevertheless, to avoid confusion and to protect the reasonable expectations of existing applicants, the Commission should establish a new processing round for the additional applications that have been filed. Further, based on Commission precedent, Viasat’s modification application should be considered as a part of this subsequent processing round.

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<sup>10</sup> Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters, IB Docket No. 16-408, *Report and Order and Further Notice of Proposed Rulemaking*, FCC 17-122, ¶ 61 (Sept. 27, 2017).

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

## II. COMMISSION PRECEDENT DICTATES THAT VIASAT'S MODIFIED NGSO SYSTEM BE CONSIDERED IN THE NEXT V-BAND PROCESSING ROUND

Section 25.116 of the Commission's rules clearly states that applicants that seek to *amend* pending applications for NGSO systems will be treated as a part of a new application processing round if the amendment is filed after the cut-off deadline for the processing round and the application "increases the potential for interference, or changes the proposed frequencies or orbital locations to be used."<sup>13</sup> In contrast, Section 25.117 of the Commission's rules is less detailed with respect to the treatment of *modifications* for previously approved NGSO systems, explaining only that such applications will be approved unless such grant "would not serve the public interest, convenience, and necessity."<sup>14</sup>

The Commission, however, has long interpreted Sections 25.116 and 25.117 of its rules to produce a consistent result, concluding in its 1999 Teledesic decision that if a modification application presents "significant interference problems, we would treat the modification as a newly filed application and would consider the modification application in a subsequent satellite processing round."<sup>15</sup> The Commission has adhered to this approach in its most recent decisions, explaining last year that its 1999 Teledesic decision "provided criteria that would be applied when determining whether a modification request would be granted."<sup>16</sup> The Commission also recently

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<sup>13</sup> 47 C.F.R. § 25.116(b)(1) (treating such applications as major amendments).

<sup>14</sup> 47 C.F.R. § 25.117(d)(2)(ii).

<sup>15</sup> Teledesic LLC for Minor Modification of License to Construct, Launch and Operate a Non-Geostationary Fixed Satellite Service System, *Order and Authorization*, 14 FCC Rcd 2261, ¶ 5 (Jan. 29, 1999) (*citing* Geostar Positioning Corporation, 6 FCC Rcd. 2276 (Com. Car. Bur. 1991)).

<sup>16</sup> Space Exploration Holdings, LLC, Request for Modification of the Authorization for the SpaceX NGSO Satellite System, DA-19-342A1, *Order and Authorization*, ¶ 9 (Int. Bur. Apr. 26, 2019).

explained that the Teledesic criteria “is consistent with the purpose of the Commission’s processing round procedure, which is designed to establish the interference environment in which participants in the processing round could operate their systems.”<sup>17</sup>

In considering whether an NGSO system will significantly increase the potential for interference to other NGSO systems, the Commission has repeatedly focused primarily on changes that increase the number of satellites in a constellation. As the Commission has explained, “the number of spatial configurations that have the potential for generating interference” between NGSO systems is considered to be “a fundamental element in assessing whether there would be significant interference problems as a result of granting the proposed modification.”<sup>18</sup> In less abstract terms, the Commission has observed that “NGSO licensees can more easily coordinate with an NGSO constellation that has 30 satellites instead of 288.”<sup>19</sup>

In this case, Viasat has proposed in excess of a fourteen-fold increase in its satellites, increasing from 20 active spacecraft to 288. Of comparable importance, Viasat is proposing to reduce the inclination of its satellites from 87° to 45°, further increasing the density of its constellation over the major industrialized population centers in the Americas, Europe and Asia.

Viasat submitted a technical analysis asserting that its proposed modification of its NGSO constellation would not significantly increase the interference to other NGSO systems because the probability of inline events between Viasat’s satellites and other NGSO satellites will not

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<sup>17</sup> *Id.*

<sup>18</sup> *Id.*, ¶ 11.

<sup>19</sup> Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-Band, IB Docket No. 02-19, *Report and Order*, FCC 03-137, ¶ 26 (July 9, 2003).

increase.<sup>20</sup> Viasat's analysis, however, failed to consider the impact of its proposed modification on Boeing's V-band NGSO system.<sup>21</sup> Further, Viasat's analysis involving other NGSO systems inappropriately treats all inline events as fungible regardless of their location over the Earth.

Most NGSO constellations are designed based on the maximum throughput capacity that they can provide to the most densely concentrated areas that they serve. For NGSO constellations designed to primarily directly serve individual consumers, this would be the largest cities. For NGSO constellations primarily serving maritime or aviation, this would be the areas around major ports or airports. In either case, the vast majority of the world's population and commerce exists between 55° North and 10° South latitude, with the most densely populated areas between 22° and 37° North latitude. Thus, every inline event involving NGSO satellites between these latitudes will have a much greater impact on the maximum throughput capacity of an NGSO system as compared to inline events that take place North or South of these regions.

Viasat is proposing to greatly increase the number of its satellites, while at the same time reducing their inclination and thus concentrating far more of its satellites in these densely populated regions. These two changes will significantly increase the resulting interference and inline events to other NGSO systems in those locations where their throughput capacity is needed most. Thus, if the Commission approves Viasat's modification as a part of the existing application processing round, it will result in an effective reduction in the maximum throughput capacity of other NGSO systems operating in the V-band, unless those other NGSO system operators modify their constellations as well. Given these facts, the Commission should protect

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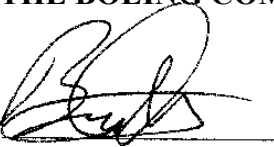
<sup>20</sup> See *Viasat Application*, Exhibit B (Technical Annex) at Exhibit 1 (NGSO Sharing Analysis).

<sup>21</sup> See *id.* at 13.

the reasonable investment expectations of other NGSO system applicants by considering Viasat's modification application within a subsequent processing round for NGSO systems seeking access to V-band spectrum.

Respectfully submitted,

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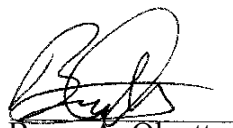
August 31, 2020



## CERTIFICATE OF SERVICE

I, Bruce A. Olcott, hereby certify that on August 31, 2020, I caused a copy of the foregoing Comments of The Boeing Company to be served by U.S. first-class mail, postage paid, upon the following:

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