

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

|                                 |   |                                      |
|---------------------------------|---|--------------------------------------|
| In the Matter of                | ) |                                      |
|                                 | ) |                                      |
| O3b Limited                     | ) | IBFS File No. SAT-AMD-20170301-00026 |
|                                 | ) | Call Sign S2935                      |
|                                 | ) |                                      |
| Space Exploration Holdings, LLC | ) | IBFS File No. SAT-LOA-20170301-00027 |
|                                 | ) | Call Sign S2992                      |
|                                 | ) |                                      |
| Telesat Canada                  | ) | IBFS File No. SAT-PDR-20170301-00023 |
|                                 | ) | Call Sign S2991                      |
|                                 | ) |                                      |

**CONSOLIDATED COMMENTS OF VIASAT, INC.**

ViaSat, Inc. (“ViaSat”) hereby comments on the above-captioned applications, which were filed by O3b Limited (“O3b”), Space Exploration Holdings, LLC (“SpaceX”), and Telesat Canada (“Telesat”) in the pending non-geostationary-satellite orbit (“NGSO”) processing round covering frequencies in the V band (the “Applications”).<sup>1</sup>

Each of the Applications seeks authority to operate an NGSO system using the 37.5-42 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz band segments (the “Applications”).<sup>2</sup> The current international framework for FSS operations in these band segments requires NGSO systems to protect GSO networks from unacceptable interference, pursuant to Article 22.2 of the ITU’s

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<sup>1</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*, Public Notice, DA 16-1244 (rel. Nov. 1, 2016); *Policy Branch Information, Satellite Space Applications Accepted for Filing*, Public Notice, Rept. No. SAT-01262 (rel. Aug. 25, 2017).

<sup>2</sup> ViaSat previously filed comments to other applications in this processing round. See Consolidated Comments of ViaSat, Inc., IBFS File Nos. SAT-LOA-20161115-00117, SAT-AMD-20170301-00029, SAT-LOI-20170301-00031 (filed July 17, 2017) (commenting on applications by Audacy Corporation, Theia Holdings A, Inc., and WorldVu Satellites Limited).

Radio Regulations. While there are no equivalent power-flux density (“EPFD”) or other limits for V-band FSS operations—either in the Commission’s rules or internationally—that might provide a different sharing paradigm than that provided by Article 22.2, other parameters for NGSO-GSO coexistence in the V band are being studied for the 2019 World Radio Conference (“WRC-19”). In bands where EPFD limits have not been established, Article 22.2 imposes a more general obligation that “[n]on-geostationary-satellite systems shall not cause unacceptable interference to and, unless otherwise specified in these Regulations, shall not claim protection from geostationary satellite networks in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations.”<sup>3</sup> In other words, Article 22.2 is separate and distinct from other provisions in Article 22.5 that specify EPFD limits for NGSO systems operations in specific frequency bands, including portions of the Ku- and Ka-bands.<sup>4</sup>

Although the Commission does not currently have rules for sharing between NGSO systems and GSO networks in the V band, the Commission has recognized the need to accommodate both types of satellite networks in the same portions of the radio spectrum. The Commission recently released a draft order in the pending rulemaking proceeding addressing NGSO systems, which would allow both types of systems to be authorized based on default sharing rules that are equivalent to the Article 22.2 framework.<sup>5</sup>

ViaSat also is an applicant in this processing round. ViaSat currently provides satellite broadband services using a fleet of Ka-band GSO satellites, and is expanding its existing capacity with additional GSO satellites featuring even more advanced capabilities and through

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<sup>3</sup> ITU Rad. Reg. Art. 22.2.

<sup>4</sup> See ITU Rad. Reg. Art. 22.5C-I.

<sup>5</sup> See FCC-CIRC1709-04 (“NGSO Draft Order”).

different satellite technologies, including through its proposal to implement a new NGSO system, which would use spectrum in the Ka and V bands.<sup>6</sup> As demand for ViaSat’s satellite broadband technology continues to grow, particularly for bandwidth-intensive applications such as streamed video, and as consumers increasingly demand ubiquitous broadband connectivity, V-band spectrum has become a critical resource for expanding services to meet consumer needs.<sup>7</sup> Thus, ViaSat anticipates utilizing V-band spectrum in its future systems—both for NGSO and GSO technologies—and other satellite operators have also expressed their expectation that V-band spectrum will be required for the continued growth of satellite capacity.<sup>8</sup>

Thus, ViaSat urges the Commission to ensure that any grant of an Application, or of any other NGSO application in this processing round, does not preclude or impede deployment of GSO systems in the V band. Facilitating deployment of both NGSO and GSO systems in the V band, including through the default GSO-NGSO sharing rule proposed in the NGSO Draft Order, would ensure efficient and intensive use of scarce satellite spectrum resources. Further, ViaSat requests that any grant of an Application, or of any other NGSO application in this processing round, be explicitly conditioned upon the outcome of any future proceeding that may specifically address V-band NGSO operations or sharing issues, in order to ensure that the authorized NGSO systems can coexist with future GSO systems, as well as with any future NGSO systems.

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<sup>6</sup> See ViaSat, Inc., IBFS File No. SAT-LOI-20161115-00120, Call Sign S2985 (filed Nov. 15, 2016).

<sup>7</sup> See, e.g., Comments of ViaSat, Inc., GN Docket No. 14-177, *et al.*, at 3 (filed Sept. 30, 2016); Reply Comments of ViaSat, Inc., GN Docket No. 14-177, *et al.*, at 3 (filed Oct. 31, 2016).

<sup>8</sup> See, e.g., Comments of the Satellite Industry Association, GN Docket No. 14-177, *et al.*, at 6 (filed Oct. 3, 2016); Comments of The Boeing Company, GN Docket No. 14-177, *et al.*, at 5 (filed Sept. 30, 2016); Comments of the Global VSAT Forum, GN Docket No. 14-177, *et al.*, at 3 (filed Sept. 30, 2016).

## I. BACKGROUND

In their respective Applications, each of O3b, SpaceX and Telesat seeks authority to operate an NGSO system in the 37.5-42 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz band segments, in addition to other spectrum. Section 25.156(d)(5) of the Commission's rules provides that where the Commission has not yet adopted band-specific satellite service rules—which is the case in the V-band frequencies at issue here—the Commission will not consider an application seeking authority to operate an NGSO-like satellite network after it has granted an application for GSO-like operations in the same band segment, unless and until the Commission establishes NGSO-GSO sharing criteria for that frequency band segment, or vice versa.<sup>9</sup> Under this rule, priority would be established for the type of service (GSO-like or NGSO-like) that is filed first.<sup>10</sup> The Commission has previously granted GSO authorizations in portions of these bands; thus, the restriction on NGSO applications potentially applies. Accordingly, each of the applicants seeks a waiver of this restriction out of an abundance of caution, and indicates that it intends to coordinate or take other measures to coexist with future GSO systems.<sup>11</sup>

Notably, the Commission has proposed to delete this restriction in its pending rulemaking proceeding where it is considering the licensing framework for new NGSO FSS technologies

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<sup>9</sup> 47 C.F.R. § 25.156(d)(5).

<sup>10</sup> *See Amendment of the Commission's Space Station Licensing Rules and Policies*, First Report and Order, 18 FCC Rcd 10760, at ¶ 58 (2003).

<sup>11</sup> *See* O3b Limited, IBFS File No. SAT-AMD-20170301-00026, Call Sign S2935, Amendment at 5-6, 9 & Attachment A Technical Annex at 10-11 (filed Mar. 1, 2017); Space Exploration Holdings, LLC, IBFS File No. SAT-LOA-20170301-00027, Waiver Requests at 11-12 & Attachment A Technical Information at 32 (filed Mar. 1, 2017); Telesat Canada, IBFS File No. SAT-PDR-20170301-00023, Petition at 27 & Appendix A Technical Exhibit at 15 (filed Mar. 1, 2017).

that have been proposed in the currently pending Ka and V band processing rounds,<sup>12</sup> and the recently released NGSO Draft Order confirms that the Commission is poised to adopt these proposal.<sup>13</sup> The Commission’s proposed revision of the underlying rule recognizes the need to accommodate both NGSO and GSO systems and would allow both types of systems to continue to be licensed in bands where the Commission has not yet adopted specific service rules. In addition, the Commission proposes as a default sharing rule a provision similar to Article 22.2 of the ITU Radio Regulations, under which NGSO systems “must not cause unacceptable interference to, and must not claim protection from, GSO FSS networks.”<sup>14</sup>

The *NGSO NPRM* and the NGSO Draft Order also propose other licensing and service rules for NGSO systems, including rules to facilitate sharing among NGSO systems operating on a co-frequency basis. Although neither the *NGSO NPRM* nor the NGSO Draft Order addresses EPFD limits that might be appropriate for the V band, the NGSO Draft Order confirms that aspects of NGSO-NGSO sharing, including avoidance of in-line events, as well as modified milestones and geographic coverage requirements, are intended to apply in the V band.

## **II. ANY GRANT OF AN APPLICATION SHOULD BE CONDITIONED UPON A REQUIREMENT TO ADEQUATELY PROTECT GSO NETWORKS**

ViaSat urges the Commission to ensure that future licensing and operation of GSO networks in the V band would not be adversely affected by the NGSO systems that may be

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<sup>12</sup> 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, at ¶ 21 (Dec. 14, 2016) (“*NGSO NPRM*”).

<sup>13</sup> See NGSO Draft Order at ¶ 39

<sup>14</sup> NGSO NPRM at ¶ 21; see also ITU Rad. Reg. Art. 22.2 (WRC-07); NGSO Draft Order at ¶ 39.

authorized in this processing round. Given the scarcity of spectrum resources, and the exploding demand for broadband services, efficient and intensive use of spectrum is critical. Enabling coexistence between NGSO and GSO technologies in the V band would promote these goals.

Significantly, the Commission has tentatively concluded in the *NGSO NPRM* that there is no need to defer licensing of GSO or NGSO systems in the V band until band-specific service rules are adopted,<sup>15</sup> and intends to adopt a default GSO-NGSO sharing framework modeled on the existing international framework in Article 22.2 of the ITU Radio Regulations,<sup>16</sup> which already applies in the V band and requires that NGSO systems not cause unacceptable interference to, or claim protection from, GSO systems. Under this framework, NGSO systems need to be coordinated with GSO networks unless and until the ITU adopts EPFD limits at WRC-19 that provide different sharing parameters. By way of example, modulating unwanted energy emitted in the direction of GSO networks, and/or maintaining adequate angular isolation, are ways such sharing could be accomplished during coordination.

Going forward, appropriate single-entry and aggregate EPFD limits, in both the uplink and downlink directions, also could be an effective means to protect GSO systems in the V band. While no such limits currently exist, either in the Commission's rules or internationally, EPFD limits are being studied at the ITU for certain portions of the V band, as part of WRC-19 preparations. Such limits could serve as the basis for U.S. rules in a future proceeding. That said, any such EPFD limits should include both single-entry and aggregate limits in each of the uplink and downlink directions, and should include a suitable mechanism for enforcement and ensuring compliance.

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<sup>15</sup> See *NGSO NPRM* at ¶ 21.

<sup>16</sup> See *NGSO Draft Order* at ¶ 39.

Pending the Commission's commencement of a proceeding to adopt specific limits to afford adequate protection to GSO systems in the V band, ViaSat urges the Commission to condition the grant of the Applications, and any other NGSO systems authorized in this processing round, on compliance with Article 22.2 and the results of international coordination, as the Commission contemplates in the NGSO Draft Order. In addition, as discussed below, the grants should be subject to the outcome of any future proceeding in which the Commission may adopt specific service or other sharing rules for the V band.

### **III. ANY GRANT OF AN APPLICATION SHOULD BE SUBJECT TO THE OUTCOME OF ANY FUTURE PROCEEDING REGARDING V-BAND NGSO OPERATIONS**

The NGSO Draft Order, which is slated for adoption at the Commission's open meeting this month, would establish rules applicable to the V-band systems proposed in the Applications. Although much of the focus of the *NGSO NPRM* was on Ka-band NGSO service rules, the Commission initiated the proceeding to address more broadly the "new generation of NGSO FSS systems [that] have emerged and initiated the international coordination process for constellations of hundreds or thousands of satellites," including Boeing's V-band NGSO application, which is the lead application in the V-band processing round.<sup>17</sup> The NGSO Draft Order confirms that, in addition to the issue of NGSO-GSO sharing discussed above, the outcome of the rulemaking proceeding would also apply to V-band NGSO-NGSO sharing. Specifically, the NGSO Draft Order addresses sharing among co-frequency NGSO systems, as well as milestone and geographic coverage requirements, and would extend these new rules to all

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<sup>17</sup> *Id.* at ¶ 3.

frequency bands.<sup>18</sup> These rules would apply to any grant of the Applications or any other application in this processing round.

As noted above, the NGSO rulemaking proceeding does not address any EPFD limits for V-band NGSO operations, and technical studies are underway at the ITU to develop such limits. Once suitable limits are established internationally (including aggregate limits in all directions and suitable enforcement mechanisms), the Commission may consider in the future whether specific EPFD limits for V band should be adopted in the United States. Therefore, any grant of an Application, or any other application in this processing round, should be conditioned upon a requirement to comply with any technical rules that the Commission may adopt for V-band NGSO operations in a future rulemaking proceeding.

#### **IV. CONCLUSION**

For the reasons provided above, ViaSat urges the Commission to ensure that any grant of an Application, or any other NGSO applications in this processing round, would not impede future GSO network deployment in the same frequency bands. Until different sharing criteria for the V band are developed and adopted by the Commission, NGSO systems should be required to protect GSO systems from unacceptable interference and should not be allowed to claim protection from GSO systems, all subject to the results of coordination, as contemplated in the NGSO Draft Order. In addition, ViaSat respectfully requests that any grant of an application in this processing round be explicitly conditioned upon the outcome of any future proceeding that may specifically address V-band NGSO operations.

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<sup>18</sup> See NGSO Draft Order at ¶¶ 52, 66-67, 70.

Respectfully submitted,

/s/

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September 25, 2017

**CERTIFICATE OF SERVICE**

I, Kayla Ernst, hereby certify that on this 25th day of September, 2017, I served a true copy of the foregoing Consolidated Comments of ViaSat, Inc. via first-class mail upon the following:

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