

Exhibit A

Description of Modification and Analysis Under Commission Framework

Overview of Proposed Modification

Pursuant to Sections 25.117(d) and 25.137(f) of the Commission’s rules,¹ Viasat, Inc. (“Viasat”) requests authority to modify the authorization for its VIASAT-NGSO satellite system that was granted as part of several processing rounds for Ka- and V-band systems commenced in 2016 and 2017 (collectively, the “2016 Round”).² That authorization reserves spectrum for Viasat in the United States in the 17.8-18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, 27.5-29.1 GHz, and 29.5-30 GHz portions of the Ka-band, and in the 37.5-42.0 GHz, 47.2-50.2, and 50.4-51.4 GHz portions of the V-band.³

The proposed modification (i) utilizes extremely-high-capacity satellites, each of which is expected to have up to 4 to 5 times the capacity of any low-earth-orbit (LEO) satellite proposed to date, (ii) supports sub-100 ms latency broadband service, and (iii) is optimized to cover American homes and small businesses in the contiguous United States (CONUS). Moreover, the design of the constellation allows the highest standards of space safety to be met for this LEO constellation as a whole, while also providing innovative, affordable, sub-100 ms latency broadband service. In addition, it does so, in accordance with Commission precedent, without creating “any significant interference problems” for other FCC-authorized NGSO systems.

More specifically, and as further detailed in the Technical Annex included as Exhibit B (the “Technical Annex”), this modification proposes to increase the number of active satellites from 20 to 288, and to lower the orbital altitude and inclination from 8,200 km and 87° to 1,300 km and 45°. Authorized frequencies, PFD levels, and EPFD levels remain unchanged.

¹ 47 C.F.R. §§ 25.117(d), 25.137(f).

² See *OneWeb Petition Accepted for Filing, Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Rcd 7666 (2016); *Cut-Off Established for Additional NGSO-Like Satellite Applications for 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, 29.1-29.5 GHz Bands*, Public Notice, DA 17-524, 32 FCC Rcd 4180 (2017); *Boeing Application Accepted for Filing in Part, 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, 31 FCC Rcd 11957 (2016).

³ *Viasat, Inc., Petition for Declaratory Ruling Granting Access for a Non-U.S.-Licensed Non-Geostationary Orbit Satellite Network*, IBFS File Nos. SAT-PDR-20161115-00120; SAT-APL-20180927-00076, Call Sign S2985, Order and Declaratory Ruling, FCC 20-56 (rel. Apr. 23, 2020) (“*Viasat NGSO Authorization*”); see also *Viasat, Inc., IBFS File Nos. SAT-PDR-20161115-00120; SAT-APL-20180927-00076*, Bond Submission (filed May 21, 2020). The VIASAT-NGSO system as modified will continue to be operated under the authority of the Netherlands and subject to coordination agreements reached with satellite systems and networks authorized by other administrations. See *Viasat NGSO Authorization* at ¶ 51(a).

Technical information relating to the modified satellite system is provided in Schedule S and in narrative form in the Technical Annex. The updated information provided in the Technical Annex should be read along with the technical annex included in Viasat’s initial Petition, as amended, as well as along with the accompanying Schedule S, which has been amended and restated in its entirety to reflect the proposed changes. Given the limited nature of this modification, Viasat does not restate the other information contained in its original Petition, as amended. Viasat certifies that, except as addressed in this modification application, the information required under Section 25.114 and previously provided remains unchanged.⁴

Consistent with the terms of its authorization, Viasat will seek in the future the Commission’s approval of a suitable showing regarding off-axis PFD levels from a VIASAT-NGSO satellite at the GSO arc with respect to satellite-to-satellite communications.⁵

Updated ownership information is contained in Exhibit C.

Analysis Under Commission Framework

Viasat proposes to optimize coverage of CONUS, enable service at sub-100 ms latency levels, and also use its authorized radio spectrum more efficiently. At the same time, Viasat commits to operate (i) within the same authorized frequencies, and (ii) otherwise within the same technical envelope and operating environment established in the 2016 Round. This application therefore should be processed and granted as a modification to the 2016 Round authorization under Section 25.117(d).

This modification application is consistent with Commission precedent and with a number of other 2016 Round modifications granted in the past year.⁶ As the Commission has explained, “[g]iven the fairly lengthy time period required to construct a satellite, licensees often file requests to modify the technical design of their satellites as they are being built.”⁷ Moreover, “[i]n recognition of the several years required to construct a satellite, or constellation of satellites, the rapidly changing technology, and our goal of encouraging more efficient use of the radio spectrum,” the Commission “allow[s] licensees to modify their satellite systems when

⁴ Viasat, Inc., IBFS File Nos. SAT-PDR-20161115-00120, Attachment A (filed Nov. 15, 2016; granted Apr. 22, 2020) (“Viasat Petition”); SAT-APL-20180927-00076, Exhibit A (filed Sept. 27, 2018; granted Apr. 22, 2020) (“Viasat Amendment”); see 47 C.F.R. § 25.117(d)(1).

⁵ *Viasat NGSO Authorization* at ¶¶ 23, 52(f).

⁶ See *Space Exploration Holdings, LLC*, File No. SAT-MOD-20181108-00083, Call Signs S2983/S3018, 34 FCC Rcd 2526 (2019) (“*SpaceX First Mod Order*”); *Space Exploration Holdings, LLC*, File No. SAT-MOD-20190830-00087, Call Signs S2983/S3018, 34 FCC Rcd 12307 (2019) (“*SpaceX Second Mod Order*”).

⁷ *Teledesic LLC*, 14 FCC Rcd 2261 ¶ 5 (1999) (“*Teledesic Order*”) (quotation marks and citation omitted).

possible.”⁸ Indeed, such modifications are routinely granted because they “allow[] the licensee to take advantage of the latest technology in providing service to the public.”⁹

Commission precedent provides for a requested modification of an NGSO-like space station constellation authorized in a processing round to be granted under Section 25.117, and outside of a new processing round, unless one of the following enumerated exceptions applies:¹⁰

- (i) Where the application seeks to “increase the authorized bandwidth.”¹¹
- (ii) Where granting the modification would not serve the public interest, convenience, and necessity.¹²

The first exception does not apply because Viasat is not requesting access to additional spectrum, and thus does not seek to increase its authorized bandwidth.¹³ As to the second exception, the Commission has explained that “we will grant an application to modify a space station license *unless* we determine that the modification requested will not serve the public interest.”¹⁴ Noting that “Section 25.117 by itself does not set forth the criteria for making this public interest determination,”¹⁵ the Commission has relied on the *Teledesic* decision for the criteria to be applied when determining whether a modification request may not be granted.

Under the *Teledesic* decision, the Commission considers whether a modification would “create any significant interference problems to other systems or make sharing [with] other NGSO FSS systems significantly more difficult.”¹⁶ And, in doing so, the Commission considers not only potential sources of increased interference or sharing difficulties, but also potential mitigation.¹⁷ As reflected most recently in the *Viasat NGSO Authorization*, the determinative factor in a case such as this is “the number of times constellations will be required to reduce

⁸ *Id.*

⁹ *Id.* (quoting *American Satellite Company*, 5 FCC Rcd 1186, 1186 (1990)).

¹⁰ See *SpaceX First Mod Order* at ¶ 7.

¹¹ *Id.*; 47 C.F.R. § 25.117(d)(2)(iv).

¹² *SpaceX First Mod Order* at ¶ 7; 47 C.F.R. § 25.117(d)(2)(ii).

¹³ See *SpaceX First Mod Order* at ¶ 8 (request “to use some of the authorized frequencies in a different manner than previously authorized. . . does not rise to a request to ‘increase the authorized bandwidth’ of the original application as granted.”).

¹⁴ *Id.* ¶ 9 (emphasis added).

¹⁵ *Id.*

¹⁶ *Teledesic Order* at ¶ 7.

¹⁷ *Id.* ¶ 18. (“Significantly, remedial technical mitigation, such as improvements in the earth station antenna pattern, can be used to mitigate the increased interference potential resulting from an increase in power.” (footnote omitted)).

spectrum” as a result of the modification.¹⁸ As demonstrated in the Technical Annex, that number will be no greater than under the existing *Viasat NGSO Authorization*.¹⁹

This modification will neither create significant interference problems, nor make sharing significantly more difficult, as demonstrated in the Technical Annex. As an initial matter, the modified system will operate within the power density levels already authorized. In fact, because the satellites are located much closer to Earth, less uplink and downlink EIRP density is needed to close the links than before. Moreover, Viasat commits to ensuring that the actual operation of its modified system maintains the same expected operating environment with respect to other systems authorized in the 2016 Round that are implemented. In particular, with respect to such systems, and as demonstrated in Technical Annex, band-splitting events under the NGSO sharing framework in Section 25.261 do not exceed the probabilities that would have been experienced with respect to Viasat’s original system design. Because the number of times that other 2016 Round constellations will be required to reduce spectrum will be no greater than before, there will be no significant increase in interference, and sharing with other NGSO FSS systems will not be significantly more difficult.

While not necessary to demonstrate under a Section 25.117(d) analysis because of the presumption described above, grant of this modification request would affirmatively serve the public interest for a number of reasons. First, the modified system has been optimized to deliver sub-100 ms broadband service to homes and small businesses throughout CONUS.²⁰ Chairman Pai has explained that “[n]ext-generation satellites are bringing new competition to the broadband marketplace and new opportunities for rural Americans who have had no access to

¹⁸ *Viasat NGSO Authorization* at ¶ 12.

¹⁹ A proposed modification of a system design well before deployment is properly analyzed under the longstanding framework described above, and not with reference to a framework that may apply to a modification application filed after a licensee has already deployed its system, and has failed after six (or nine) years to deploy the number of authorized spacecraft in accordance with its milestones. *Cf. Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809 ¶ 67 & n.150 (2017) (“*NGSO Order*”), *reconsideration pending*.

²⁰ The proposed coverage not only is optimized for CONUS, but also is consistent with the Commission’s proposal to eliminate the coverage requirement in Section 25.146(b). *See NGSO Order* at ¶ 76. To the extent necessary, Viasat seeks a waiver of the coverage requirement in Section 25.146(b) because the inclination of the orbital planes does not support coverage north of 60° North latitude or south of 60° South latitude. This is consistent with at least one prior waiver based on similar limitations. *See, e.g., O3b Limited*, IBFS File Nos. SAT-LOI-20141029-00118, SAT-AMD-20151115-00004, Stamp Grant ¶ 14 (granted Jan. 22, 2015). Should the Commission not adopt this rule change, and to the extent necessary, Viasat reserves the right to modify its application to conform to the rules ultimately adopted in that proceeding. *See, e.g., OneWeb Petition Accepted for Filing, Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Rcd 7666, 7667 (2016) (“Applicants and petitioners that file by the cut-off date will be afforded an opportunity amend their requests, if necessary, to conform to any requirements or policies that may be subsequently adopted concerning NGSO-like satellite operation in these bands.”).

high-speed Internet access for far too long.”²¹ Moreover, the modified system responds to the Commission’s recently-stated policy goal of encouraging the deployment of infrastructure capable of supporting sub-100 ms broadband service.²² The modified design thus provides the opportunity to deploy another means of serving those needs and goals. Indeed, each of the extremely-high-capacity satellites in the modified constellation is expected to have up to 4 to 5 times the capacity of any LEO satellite proposed to date. Second, the modification better enables Viasat to mitigate the disproportionate impact of the default band-splitting rules on certain NGSO constellation designs, by providing Viasat the opportunity to employ satellite diversity as a mitigation technique more often than otherwise would have been possible with its previous design—a design that was proposed before the Commission changed its spectrum sharing rules for NGSO FSS systems.²³ Furthermore, the modified LEO constellation is capable of satisfying the Commission’s proposed collision-risk standard of less than 0.001 on an entire constellation basis, and over a 15-year license term. This constellation therefore can meet the highest standards of space safety for a LEO constellation as a whole, while still providing innovative, affordable, sub-100 ms latency broadband service.

²¹ Chairman Ajit Pai, Remarks at the Satellite Industry Association’s 21st Annual Leadership Dinner at 2 (Mar. 12, 2018), available at <https://www.fcc.gov/document/chairman-pai-remarks-satellite-industry-association-dinner>.

²² See *Rural Digital Opportunity Fund; Connect America Fund*, Report and Order, 35 FCC Rcd 686 (2020).

²³ Viasat’s existing NGSO system design was based on the Ka- and V-band spectrum sharing rules in effect at the time, which (except for the 18.8-19.3 GHz and 28.6-29.1 GHz band segments) broadly provided for across-the-board band splitting among applicants in an NGSO-like processing round in the case of unresolved interference cases, and not just during in-line events. Extending the in-line-only band-splitting mechanism to all bands available for NGSO licensing (subject to a 6% delta T/T trigger event) had a disproportionate impact on certain NGSO system designs proposed before the proceeding leading to that rule change was even initiated. See Viasat Inc. Reply Comments, IB Docket No. 16-408, at 22-23 (filed Apr. 10, 2017). That is why the Commission has recognized the importance of “good faith coordination” (before resorting to band splitting during 6% delta T/T trigger events) as a means to “mitigate potentially unequal burdens for smaller NGSO FSS systems or those in highly elliptical orbits.” *NGSO Order* at ¶ 48 n.111.