

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

In the Matter of)	
)	
Space Exploration Holdings, LLC)	SAT-LOA-20170301-00027; Call Sign S2992
)	
Telesat Canada)	SAT-PDR-20170301-00023; Call Sign S2991
)	
NGSO-Like Satellite Applications or Petitions for)	
U.S. Market Access in the 37.5-40.0 GHz, 40.0-)	
42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz Bands)	

COMMENTS OF SES S.A. AND O3B LIMITED

SES S.A. (“SES”) and its subsidiary O3b Limited (“O3b”), hereby comment on the above-captioned non-geostationary orbit (“NGSO”) satellite license application and request for authority to serve the U.S. market (collectively, the “V-band NGSO Filings”).¹ As discussed herein, SES and O3b urge the Commission to defer action on the V-band NGSO Filings until appropriate standards to prevent interference to V-band geostationary orbit (“GSO”) systems are in place. In addition, the Commission must impose clear requirements regarding any future NGSO system’s obligation to share spectrum with other co-frequency NGSO operations. Finally, any authorizations issued must include terms and conditions consistent with those imposed in other bands on other NGSO operators, including O3b.

BACKGROUND

SES, one of the world’s largest commercial communications satellite operators, is uniquely positioned to address issues raised by the V-band NGSO Filings because its facilities include both GSO and NGSO satellite fleets. SES entities operate more than 50 GSO satellites

¹ *Space Exploration Holdings, LLC*, File No. SAT-LOA-20170301-00027 (the “SpaceX Application”); *Telesat Canada*, SAT-PDR-20170301-00023 (the “Telesat Petition”).

able to reach 99% of the world's population, many of them pursuant to Commission authority. SES subsidiary O3b provides high-throughput, low-latency connectivity via an NGSO satellite network authorized to serve the U.S.² that combines satellite reach with fiber optic speed, delivering the performance of fiber in places terrestrial networks do not reach, and making affordable broadband connectivity possible for billions of consumers and businesses in nearly 180 countries. O3b currently operates twelve satellites in a Medium Earth Orbit ("MEO") configuration, and has requested authority for additional spacecraft and spectrum in order to accommodate growing demand for O3b's high-performance connectivity.³

The V-band NGSO Filings seek Commission authority for new NGSO fixed-satellite service ("FSS") systems that would operate in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz Bands (collectively the "V-band"). While the Commission does not have service rules for the V-band, the band may also be used by GSO satellite systems. As other FSS bands become increasingly saturated, access to V-band spectrum is critical to permit expansion of existing GSO and NGSO satellite services in response to customer demand. Accordingly, a Commission framework to ensure that proposed NGSO operations will be able to successfully co-exist both with future GSO operations and with other NGSO systems must be in place before the Commission can act on the V-band NGSO Filings. Any grants that are ultimately issued must also include terms and conditions similar to those applied to O3b and other NGSO FSS systems in other bands.

² *O3b Limited*, Call Sign S2935, File Nos. SAT-LOI-20141029-00118 & SAT-AMD-20150115-00004, grant-stamped Jan. 22, 2015, corrected and re-issued June 2, 2015 (the "O3b Market Access Grant").

³ *O3b Limited*, Call Sign S2935, File Nos. SAT-MOD-20160624-00060; SAT-AMD-20161115-00116; & SAT-AMD-20170301-00026.

I. THE COMMISSION MUST ADOPT RULES TO PROTECT GSO OPERATIONS BEFORE ACTING ON THE V-BAND NGSO FILINGS

As discussed above, the bands identified in the above-captioned proceedings are available for use by GSO and NGSO systems. The Commission cannot permit NGSO systems to operate in these bands unless it has adequate sharing mechanisms in place to ensure that the NGSO systems in the V-band will protect future GSO satellite networks from interference.

As both SpaceX and Telesat recognize, there are no Commission rules in place to facilitate sharing between GSO and NGSO systems in the V-band.⁴ Notably, there is a pending application with the Commission for a V-band GSO system,⁵ which adds urgency to the need for clearly defined V-band service rules for sharing the band between GSO and NGSO systems.

Similarly, the International Telecommunication Union (“ITU”) has not yet defined a technical mechanism to facilitate V-band GSO and NGSO systems sharing frequencies, but recognizes the need to develop such a mechanism. Currently, No. **22.2** of the ITU Radio Regulations applies in V-band frequencies, specifying that NGSO systems shall not cause unacceptable interference to, or claim protection from, GSO networks. SES and O3b are supporting efforts pursuant to Resolution **159 (WRC-15)** to develop approaches for spectrum sharing between GSO and NGSO satellite systems in these frequencies and believes the Commission should look to that process for guidance as it contemplates rules to protect V-band GSO systems from NGSO interference.⁶

⁴ See SpaceX Application, Attachment A at 32; Telesat Petition, Technical Exhibit at 15.

⁵ See *Hughes Networks System*, Call Sign S3017, File No. SAT-LOA-20170621-00092.

⁶ See *O3b Limited*, Call Sign S2935, File No. SAT-AMD-20170301-00026 (the “O3b V-Band Amendment”), Technical Annex at 10.

Pending adoption of a comprehensive NGSO-GSO sharing framework, SES and O3b urge the Commission to defer action on the V-band NGSO Filings. SES and O3b recognize that in the Ku/Ka-band NGSO processing round, the Commission determined that it could act on the OneWeb application in advance of completing the related rulemaking addressing Ka-band NGSO operational matters.⁷ However, in those frequencies, the Commission could rely on international EPFD limits already in place, and the OneWeb authorization specifically required compliance with those international limits.⁸ In addition, the Commission had already developed a full record in response to its comprehensive set of proposals in the NGSO rulemaking proceeding.⁹ In contrast, the effort to develop protection criteria for V-band GSO systems is still at a very early stage, with adoption of any ITU standards still years away and no pending Commission rulemaking that is examining V-band NGSO-GSO sharing.

In light of these differences, acting on the V-band NGSO Filings subject to the outcome of future proceedings would create unnecessary uncertainty for NGSO and GSO systems alike. A V-band NGSO applicant that received a grant would have to decide whether to accept the authority conferred without any meaningful guidance regarding the requirements that would ultimately apply to its system in order to prevent harmful interference to GSO networks. Operators developing GSO systems in the V-band would similarly have no concrete assurances regarding how and to what extent their future systems will be protected from interference.

⁷ *WorldVu Satellites Limited Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, File No. SAT-LOI-20160428-00041, Order and Declaratory Ruling, FCC 17-77 (rel. June 23, 2017) (“OneWeb Grant”) ¶ 12.

⁸ *See id.*, ¶ 23(h) (OneWeb’s authority is conditioned on its compliance with EPFD requirements in Article 22 of the ITU Radio Regulations).

⁹ *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, 31 FCC Rcd 13651 (2016) (“NGSO NPRM”).

As the Commission made clear in the OneWeb Grant, a Commission rulemaking is the appropriate proceeding in which to make “decisions of general applicability.”¹⁰ Any Commission attempt to address NGSO-GSO sharing matters in the context of individual application proceedings would violate that principle and put the cart before the horse. Prior to authorizing V-band NGSO systems for operations in the U.S., the Commission must establish a framework for NGSO-GSO sharing based on a fully developed record. Until such a framework is in place, the Commission should hold the V-band NGSO Filings in abeyance.

II. SHARING AMONG NGSO SYSTEMS CAN PRIMARILY BE ACHIEVED THROUGH COORDINATION, BUT BAND SEGMENTATION DURING IN-LINE EVENTS MAY BE NEEDED AS A LAST RESORT

In response to the Commission’s Notice of Proposed Rulemaking for NGSO satellite systems (“NGSO NPRM”),¹¹ SES and O3b joined other commenters in supporting Commission proposals to facilitate sharing among NGSO systems by encouraging coordination agreements focused on avoiding in-line events, as described in Section 25.261 of the Commission’s rules.¹² We agreed that band segmentation should not be the first recourse in accommodating multiple NGSO systems but noted that dividing up the spectrum for the duration of an in-line event would be necessary in certain instances.¹³ Moreover, SES and O3b urged the Commission to reject arguments that ITU priority should determine sharing status among NGSO

¹⁰ OneWeb Grant, ¶ 12.

¹¹ *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, 31 FCC Rcd 13651 (2016).

¹² Comments of SES S.A. and O3b Limited in IB Docket No. 16-408, filed Feb. 27, 2017 (“SES/O3b NGSO NPRM Comments”) at 23-27; Reply Comments of SES S.A. and O3b Limited in IB Docket No. 16-408, filed Apr. 10, 2017 (“SES/O3b NGSO NPRM Reply Comments”) at 19-27 & n.85 (citing other comments).

¹³ SES/O3b NGSO NPRM Comments at 24-25.

systems authorized to serve the U.S. market.¹⁴ The Commission should apply these policies for NGSO-to-NGSO sharing to the V-band NGSO Filings.

Section 25.261 currently only applies to the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands. In the NGSO NPRM, the Commission has proposed to expand the scope of Section 25.261 to apply to several other bands.¹⁵ SES and O3b believe the Commission should also consider including V-band spectrum in Section 25.261 in order to facilitate NGSO-to-NGSO sharing in V-band frequencies.

III. ANY GRANTS OF V-BAND NGSO FILINGS SHOULD INCLUDE STANDARD OPERATING CONDITIONS

If the Commission determines that grant of a V-band NGSO Filing is in the public interest, it should include in the authorization conditions designed to ensure that the planned operations will be consistent with Commission policies and rules as well as with international coordination obligations. The Commission can look to the O3b Market Access Grant and the OneWeb Grant for appropriate language on these matters. In particular, the following condition paragraphs from the O3b Market Access Grant should be applied to any grants of the V-band NGSO Filings:

Preamble: Operations pursuant to the grant must comport with the legal and technical specifications set forth by the applicant or petitioner and with Federal Communications Commission rules not waived herein.¹⁶

¹⁴ SES/O3b NGSO NPRM Reply Comments at 26-27 & nn.118 & 120.

¹⁵ NGSO NPRM, ¶ 23. *See also Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, NGSO Draft Report and Order, released Sept. 7, 2017.

¹⁶ Under the specific circumstances presented, the Commission determined that including this language in the OneWeb Grant was unnecessary (*see* OneWeb Grant at 11 n.71), but SES and O3b note that this provision is standard in International Bureau space station license grants and market access authorizations. *See, e.g., SES Americom, Inc.*, File No. SAT-MOD-20170316-

Condition 2: Operations must comply with all coordination agreements.

Condition 3: Requirement to maintain and make available to the North American Defense Command ephemeris data for each satellite.

Condition 5: Requirement to comply with applicable PFD limits.

Condition 6: Requirement to comply with applicable EPFD limits.

Condition 12: Designation of the means by which the system will share spectrum with other NGSO constellations issued prior to or as part of this processing round.

Grants should also include a provision similar to paragraph 26 of the OneWeb Grant specifying that authorizations granted are subject to modification in order to conform to future rules or policies adopted by the Commission.

The following conditions imposed on O3b should also be incorporated if the Commission grants the Telesat Petition seeking U.S. market access for its foreign-licensed NGSO network:

Condition 1: Limitation of services that can be provided to include only those covered by the WTO agreement.

Condition 11: Restrictions on the ability to reposition or activate satellites in the NGSO constellation without Commission approval.

Condition 15: Specification regarding the orbital debris regulatory framework for applicants relying on the orbital debris mitigation rules of other jurisdictions.

Incorporation of the above provisions is consistent with Commission rules and precedent and is necessary to ensure that operations pursuant to the V-band NGSO Filings will conform to applicable regulatory requirements.

00051, granted June 14, 2017, Attachment to Grant at 1; *SES Satellites (Gibraltar) Ltd.*, File No. SAT-PPL-20160512-0048, granted Dec. 7, 2016, Attachment to Grant at 2. Consistent with this precedent, the language should be included in any grants of the V-band NGSO Filings.

IV. CONCLUSION

For the foregoing reasons, the Commission should defer action on the V-band NGSO Filings pending adoption of rules and policies for sharing in this spectrum. The Commission should employ its standard condition language in any grants issued in response to the filings.

Respectfully submitted,

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September 25, 2017

CERTIFICATE OF SERVICE

I hereby certify that on this 25th day of September, 2017, I caused to be served a true copy of the foregoing "Reply of SES S.A. and O3b Limited" by first class mail, postage prepaid, upon the following:

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