



Federal Communications Commission
Washington, DC 20554

International Bureau

June 14, 2018

Dr. David Castiel
Virtual Geosatellite LLC
5335 Wisconsin Avenue, N.W. #640
Washington, DC 20015

Re: New Spectrum Satellite, Ltd,
IBFS File No. SAT-LOI-20170726-00111 (Call Sign S3019)

Dear Dr. Castiel:

On July 26, 2017, New Spectrum Satellite, Ltd (NSS) filed the above-captioned Letter of Intent to provide service to the United States using a non-geostationary satellite orbit (NGSO) fixed-satellite service (FSS) system utilizing C-band, Ku-band, and Ka-band frequencies. To aid in the Commission's evaluation of NSS's application, please provide updated and additional information as detailed below.¹

1. In its application, NSS states in several places that it intends to operate Earth-to-space links in the 17.8-18.6 GHz band.² In the Schedule S attachment, however, NSS includes frequencies only in the 17.8-18.3 GHz band. Please clarify the frequencies for which NSS is seeking U.S. market access, and update the Schedule S attachment if necessary.
2. Section 25.114(c)(4) specifies the information that must be provided in Schedule S for each space station transmitting and receiving antenna beam.³ In its Schedule S filing, however, NSS does not include any beam information for its tracking, telemetry or command (TT&C) beams. NSS claims that its primary space operations control center (SOCC) will be located within the United States and that this SOCC will be connected via land lines to TT&C earth stations in each of the regional service areas that have line-of-sight visibility of the NSS satellites during the active part of their orbit, and for portions of their orbit at either side of the active period.⁴ NSS does not specify, however, precisely where these TT&C earth stations will be located. Please clarify whether NSS intends to conduct TT&C operations from within the United States, and thus seeks market access for these operations. If so, please update the Schedule S attachment accordingly.
3. Section 25.114(d)(1) of the Commission's rules requires applicants to provide an explanation of how the uplink frequency bands would be connected to the downlink frequency bands on their proposed satellite system.⁵ To better understand the beam and channel connections on the NSS NGSO FSS system, we request that NSS supplement its application with a showing (*e.g.*, a strapping table, chart, or spreadsheet) that clearly presents this information.

¹ 47 CFR § 25.111(a).

² New Spectrum Satellite, Ltd., IBFS File No. SAT-LOI-20170726-00111, Narrative at viii, 32, and 58 (*NSS Application*).

³ 47 CFR § 25.114(c)(4)(i).

⁴ *NSS Application*, Narrative at 77-78.

⁵ 47 CFR § 25.114(d)(1).

4. For optical inter-satellite links, please provide the wavelength, power, duty cycle, beam diameter at emitter, and beam divergence. In addition, please provide the power margin at the receiver at maximum operating distance.
5. Please indicate whether optical inter-satellite links will be coordinated with other systems proposed in FCC applications and with the U.S. Department of Defense's laser clearing house. If such coordination has commenced, please address their status.
6. In its application, NSS provides only one .gxt file containing a single transmitting beam diagram, despite indicating a total of 286 transmitting and 318 receiving beams in its Schedule S attachment (these numbers do not include TT&C or ISL beams.) In addition, this contour diagram represents a projection from the geostationary orbit at 100° W.L., not from a location representative of NSS's proposed non-geostationary orbits.⁶ Nor does this diagram include all of the required contours (*e.g.*, -8 dB and -15 dB are absent). Although NSS states that it is infeasible to define fixed beam contours our rules afford multiple options for providing antenna gain contour information.⁷ Section 25.114(c)(4)(vi) specifies the predicted antenna gain contour information that applicants for NGSO space stations must provide. Section 25.114(c)(4)(vi)(D) specifically provides an option for satellites with steerable, non-shapeable beams, and section 25.114(c)(4)(vii)(C) provides an option for non-geostationary satellites with large numbers of identical fixed beams on each satellite. Accordingly, we request that NSS update its filing to provide the appropriate antenna gain contour diagrams consistent with section 25.114(c)(4) for each representative transmitting and receiving beam for space station type. In the alternative, if NSS seeks a waiver of section 25.114(c), it must specify why it cannot adequately represent its antenna gain contour diagrams in accordance with our rules, and must also submit the complete information in another format.
7. NSS states that it will comply with the equivalent power flux density (EPFD) and aggregate EPFD limits adopted following WRC-2000, and it references the limits adopted in the *2000 First Report and Order*.⁸ NSS also proposes operations in frequency bands beyond those in the *2000 First Report and Order*, for which Article 22 of the International Telecommunication Union (ITU) Radio Regulations specifies applicable EPFD limits.⁹ These include the 3.7-4.2 GHz, 5.925-6.725 GHz, and 17.8-18.3 GHz bands. NSS's application failed to include the technical showing required under section 25.146(a) of our rules then in effect, demonstrating that its proposed operations in the 10.7-14.5 GHz band will not exceed the validation EPFD limits as specified in section 25.208(g), (k), and (l) for EPFD_{down}, and EPFD_{up}. Recently, however, the Commission modified section 25.146(a) to require applicants proposing operations in the 10.7-30.0 GHz frequency bands to simply certify compliance with applicable EPFD levels in Article

⁶ NSS states that once better .gxt-capable software is obtained it can improve on the illustration to show projections from Virtual GEO orbit locations.

⁷ *NSS Application*, Narrative at 18.

⁸ *NSS Application*, Narrative at 41, footnote 11 citing Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-band Frequency Range, *First Report and Order and further Notice of Proposed Rulemaking*, 16 FCC Rcd 4096 (2000) (*2000 First Report and Order*).

⁹ ITU Radio Regulations, Article 22.

22, Section II and Resolution 76 of the ITU Radio Regulations.¹⁰ Accordingly, NSS must provide the appropriate certification required under section 25.146(a).

8. NSS proposes Earth-to-space transmissions from gateway earth stations in the 17.8-18.3 GHz band. The U.S. Table of Frequency Allocations does not include an allocation for the FSS in this direction.¹¹ The *NGSO FSS Report and Order* recently adopted a secondary allocation for the FSS in this band, however, that allocation is in the space-to-Earth direction.¹² Please clarify whether NSS proposes uplink transmissions from earth stations within the U.S. in this frequency band, and thus seeks U.S. market access for such transmissions. If NSS seeks a waiver of the U.S. Table of Frequency Allocations it must provide justification for such a waiver, demonstrate good cause, and must further clarify how it will avoid interference to both terrestrial and space-to-Earth FSS operations in the band.
9. Please clarify whether transmissions in the 12.2-12.7 GHz band will meet the power flux density limits specified in section 25.208(o) in any 4 kHz bandwidth for angles of arrival less than 5 degrees. In particular, please confirm that these limits are met for transmitting beams 292L-327L and 292R-327R.
10. The requested information must be submitted no later than **July 16, 2018**. Failure to do so may result in the dismissal of NSS's application pursuant to section 25.112(c) of the Commission's rules, 47 CFR § 25.112(c).

Sincerely,



Jose P. Albuquerque
Chief, Satellite Division
International Bureau

¹⁰ 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, 7822 (2017) (*NGSO FSS Report and Order*).

¹¹ A similar discrepancy exists in the 18.3-18.6 GHz band, although it is not clear whether NSS seeks U.S. market access in this band segment. See paragraph 1.

¹² *NGSO FSS Report and Order*, 32 FCC Rcd at 7811.