

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

In the Matter of)	
)	
Facilitating the Communications of Earth)	IB Docket No. 18-315
Stations in Motion with Non-Geostationary)	
Orbit Space Stations)	

REPLY COMMENTS OF SES AMERICOM, INC. AND O3B LIMITED

SES Americom, Inc. and its affiliate, O3b Limited, (collectively, “SES”) hereby submit these reply comments regarding the above-referenced Notice of Proposed Rulemaking proposing to adopt regulations to govern the operations of Earth Stations in Motion (“ESIMs”) with non-geostationary orbit (“NGSO”) satellites in the fixed-satellite service (“FSS”).¹ The record in this proceeding strongly supports implementing rules to authorize ESIMs to communicate with NGSO constellations and demonstrates that doing so will “promote innovative and flexible use of satellite technology” and foster regulatory parity between geostationary orbit (“GSO”) satellites and NGSO systems.² In adopting its proposal for ESIMs communicating with NGSO systems, the Commission should preserve the exclusive primary status of NGSO networks with respect to GSO systems in the 18.8-19.3 GHz (space-to-Earth), and the 28.6-29.1 GHz (Earth-to-space) frequency bands. The Commission should also align the authorization of NGSO ESIMs in the 11.7-12.2 GHz (space-to-Earth); 14.0-14.5 GHz (Earth-to-space); 18.3-18.6 GHz (space-to-Earth); 19.7-20.2 GHz (space-to-Earth); 28.35-28.6 GHz (Earth-to-space); and 29.5-30.0 GHz (Earth-to-space) frequency bands with the language in in Section 25.289, which provides that NGSO operations cannot cause “unacceptable interference” to GSO operations, rather than the

¹ *Facilitating the Communications of Earth Stations in Motion with Non-Geostationary Orbit Space Stations*, Notice of Proposed Rulemaking, FCC 18-160, IB Docket No. 18-135 (rel. Nov. 16, 2018) (“NPRM”).

² *Id.* at ¶ 1.

initially proposed “harmful interference.” Further, the Commission should ensure that any rule changes it makes preserve existing spectrum designations for ESIMs, such as the provision permitting earth stations on vessels (“ESVs”) in the 3.7-4.2 GHz band (“C-band”), while also making additional frequencies available for NGSO ESIMs, including the 40.0-42.0 GHz and the 48.2-50.2 GHz band (“V-band”), additional segments of the 27.5-30.0 GHz band, and even the C-band. SES also continues to support the Commission’s proposed blanket licensing regime for NGSO ESIMs, provided that any applicant for a new ESIM authorization or modification to an existing ESIM authorization must demonstrate that it will comply with its stated EIRP limit and with the Commission’s network control and self-monitoring rules. Finally, there is no need for additional rules to protect radio astronomy systems (“RAS”).

I. THE COMMISSION SHOULD AUTHORIZE NGSO ESIMs ON A SOLE PRIMARY BASIS IN THE 18.8-19.3 GHz AND 28.6-29.1 GHz BANDS AND ON A SECONDARY BASIS TO GSO NETWORKS IN OTHER BANDS

The Commission should adopt its proposals for authorizing ESIMs to communicate with NGSO FSS systems while retaining the existing priorities as between GSO and NGSO networks.³ Specifically, in the 18.8-19.3 GHz (space-to-Earth), and the 28.6-29.1 GHz (Earth-to-space) frequency bands, NGSO systems should continue to have sole primary status,⁴ and the Commission should reject EchoStar’s proposal to make GSO FSS networks co-primary with

³ Both GSO and NGSO operators support retaining the existing priorities as between GSO and NGSO networks, including SES, which is the only operator that has both GSO and NGSO systems providing service. *See* Boeing Comments at 7 (supporting primary status for NGSO ESIMs in the 18.8-19.3 GHz and 28.6-29.1 GHz spectrum, noting that these paired bands “are some of the only frequencies allocated to FSS in which NGSO FSS systems are not required under the Commission’s rules to protect GSO FSS networks”); Viasat Comments at 4 (Viasat supports “the relative status of NGSO FSS ESIMs in each of the frequency bands”).

⁴ NPRM at ¶ 10.

NGSO ESIMs in these bands.⁵ EchoStar claims that “[a]llowing NGSO ESIMs to operate on a primary basis would complicate the ability of GSO licensees to seek coordination agreements with NGSO systems that will allow these bands to be used with maximum efficiency.”⁶ But EchoStar fails to adequately address Commission precedent or to support its assertion that spectrum efficiency would be served by altering established NGSO-GSO sharing obligations.

In the recent NGSO rulemaking, the Commission decided to permit secondary GSO operations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands but affirmed the sole primary status of NGSO FSS networks, expressly rejecting arguments by EchoStar and others seeking co-primary designation for GSO use of this spectrum.⁷ The Commission determined that “preserving the 18.8-19.3 GHz and 28.6-29.1 GHz bands for more intensive use by burgeoning NGSO FSS systems will serve the public interest,” particularly given the Commission’s decision to require NGSO systems to protect GSO FSS networks in other bands.⁸ The Commission also denied EchoStar’s request that the Commission adopt a “default mechanism” that would govern sharing in these bands in the event GSO and NGSO operators do not reach agreement regarding how protection of the NGSO system will be achieved, emphasizing that:

The status of GSO FSS operations in these bands is secondary. They are entitled to no protection from any interference caused by NGSO FSS systems. . . . Since we do not intend to modify the status of GSO FSS operations in these bands, we perceive no benefit to inquiring on this point in the Further Notice.⁹

⁵ EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC (“EchoStar”) Comments at 4.

⁶ *Id.* at 4.

⁷ *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, 7813-15 (2017) (the “NGSO Order”).

⁸ *Id.* at 7814.

⁹ *Id.* at 7815.

The EchoStar Comments briefly acknowledge the NGSO Order's findings, but suggest that the Commission's decision regarding the primacy of NGSO systems in this spectrum was limited to NGSO operations with fixed earth stations.¹⁰ Nothing in the NGSO Order supports this narrow reading. To the contrary, the Commission explicitly stated its intention to give operators of NGSO systems in the 18.8-19.3 GHz and 28.6-29.1 GHz bands "greater flexibility" with respect to both "coordination discussions and ultimate deployment."¹¹

EchoStar has provided no basis for the Commission to revisit the NGSO Order's conclusions on this point. Changing the Commission's NGSO-GSO sharing regime is inappropriate in a proceeding related to ESIMs, as investments and decisions with respect to NGSO systems have been made in reliance on current rules, including the designation of frequencies where NGSO systems have primary status vis-à-vis GSO operations. NGSO-primary frequencies provide critical certainty for existing systems and promote future investments by ensuring that NGSO operators can provide a committed level of service to their customers.

Moreover, there is ample spectrum in which NGSO operations are prohibited from causing unacceptable interference to GSO operations, including the 11.7-12.2 GHz (space-to-Earth); 14.0-14.5 GHz (Earth-to-space); 18.3-18.6 GHz (space-to-Earth); 19.7-20.2 GHz (space-to-Earth); 28.35-28.6 GHz (Earth-to-space); and 29.5-30.0 GHz (Earth-to-space) frequency bands. SES urges the Commission to permit ESIMs to communicate with NGSO FSS systems on a primary basis in these frequency bands, subject to the requirement that these operations do not cause unacceptable interference to, or claim protection from, GSO FSS networks. As SES

¹⁰ EchoStar Comments at 4 & n.13.

¹¹ NGSO Order, 32 FCC Rcd at 7814.

explained in its comments, the Commission should modify its proposed revisions to footnote NG527A to conform to the language in Section 25.289 by adopting the term “unacceptable interference” instead of “harmful interference.”¹² Aligning the interference standards for ESIMs and fixed earth stations will avoid unnecessary confusion, providing a uniform framework for NGSO satellite operators. Adopting SES’s proposed change would further provide NGSO system operators with certainty that the same standards will apply across their fixed and mobile operations, while maintaining the existing GSO-NGSO sharing regime.

II. THE COMMISSION SHOULD PRESERVE AND EXPAND ESIM ACCESS TO ADDITIONAL FREQUENCY BANDS

A. C-Band Will Remain Critical for FSS Services Including ESIMs Operations

The Commission should not take any action that would undermine the availability of the C-band for use by ESVs communicating with GSO satellites. In its comments, T-Mobile acknowledges that the NPRM makes no proposals with respect to ESIMs communicating with NGSO systems using the C-band, but nevertheless requests that the Commission issue a number of unnecessary clarifications regarding its intentions with respect to C-band matters.¹³ In so doing, T-Mobile mischaracterizes the Commission’s pending proceeding on the use of the 3.7-4.2 GHz C-band downlink frequencies, claiming that the Commission is focused on “clearing satellite users *out* of the spectrum,”¹⁴ when in fact the Mid-Band NPRM to which T-Mobile

¹² SES Comments at 7-8 & n.21, *citing* 47 C.F.R. § 25.289 (“Unless otherwise provided in this chapter, an NGSO system licensee must not cause *unacceptable interference* to, or claim protection from, a GSO FSS or GSO BSS network.”) (emphasis added).

¹³ T-Mobile Comments at 1-3.

¹⁴ *Id.* at 3 (emphasis in original).

refers expresses the Commission’s commitment to accommodating incumbent FSS operations in the band.¹⁵

In the prior proceeding involving GSO ESIMs, the Commission reorganized its rules and specifically retained provisions relating to C-band ESVs, subject to the outcome of the Mid-Band NPRM.¹⁶ C-band will remain an important FSS band for ESV operations due to its weather resiliency and reliability. The Commission should therefore ensure that it does not unintentionally restrict C-band GSO ESV operations pursuant to existing rules. Nor should the Commission foreclose the possibility that C-band NGSO ESIMs could be explored in the future as the NGSO market evolves and the Mid-Band NPRM proceeding reaches a conclusion. Again, however, there is no reason for the Commission to address any C-band issues here, as they are beyond the scope of the proposals made in the NPRM.

B. SES Supports Initiation of a Proceeding on V-Band NGSO ESIMs

As discussed in its comments, SES encourages the Commission to consider NGSO ESIMs matters as part of any future proceeding developing service rules for V-band FSS.¹⁷

¹⁵ See *Expanding Flexible Use of the 3.7 to 4.2 GHz Band, et al.*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915 (2018) at ¶ 2 (“Mid-Band NPRM”). T-Mobile also wrongly refers to the Notice of Inquiry (“NOI”) regarding mid-band spectrum as having been “superseded.” T-Mobile Comments at 2. Although the Mid-Band NPRM terminated the NOI with respect to the 3.7-4.2 GHz frequencies, the NOI’s scope involves a much broader range of spectrum that includes Ku-band frequencies proposed for NGSO ESIM operations in the current NPRM. Thus, the Commission’s statement that its “open proceeding” stemming from the mid-band NOI includes “bands being considered for ESIM communication with NGSO FSS systems,” NPRM at ¶ 23, is wholly accurate and cannot be read as referring to C-band downlink spectrum.

¹⁶ See *Amendment of Parts 2 and 25 of the Commission’s Rules to Facilitate the Use of Earth Stations in Motion Communicating with Geostationary Orbit Space Stations in Frequency Bands Allocated to the Fixed-Satellite Service*, Report and Order and Further Notice of Proposed Rulemaking, FCC 18-138 (rel. Sept. 27, 2018) at ¶¶ 47-48 & n.110.

¹⁷ SES Comments at 9.

Boeing makes a similar request, arguing that the “[t]he Commission should initiate a proceeding to authorize ESIMs to operate with NGSO FSS networks in the V-band, which has long been designated by the Commission for FSS communications, including those involving NGSO systems.”¹⁸ As Boeing notes, “[s]uch action by the Commission would be consistent with the proposed activities of the International Telecommunication Union following WRC-19,” including Luxembourg’s proposed agenda item for WRC-23 addressing the authorization of ESIMs with NGSO FSS systems in a number of frequency bands, including the 37.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) bands. Commencing a proceeding is timely because the Commission has already authorized O3b and other NGSO systems to use V-band spectrum.¹⁹

C. The Commission Should Consider Allowing NGSO ESIMs in Additional Segments of the 27.5-30 GHz Band

SES supports ViaSat’s proposal that the Commission explore permitting NGSO ESIMs to use additional segments of the 27.5-30 GHz band where ESIM deployment is demonstrated to be compatible with the primary allocated services.²⁰ ViaSat notes, for example, that “the Commission has approved Viasat’s aeronautical earth stations operating in the 28.1-28.35 GHz portion of the Ka band that has been designated primarily for terrestrial wireless services,” and that the grounds for waiver – ViaSat’s showing that the earth stations would not cause harmful interference to ground-based terrestrial networks – would be equally true of ESIMs operating in the entire 27.5-28.35 GHz segment shared with terrestrial wireless services.²¹ SES encourages the Commission to consider these and other frequency bands where NGSO ESIM operations can

¹⁸ Boeing Comments at 11.

¹⁹ *See, e.g., O3b Limited*, Order and Declaratory Ruling, 33 FCC Rcd 5508 (2018).

²⁰ Viasat Comments at 6.

²¹ *Id.*

be shown to be compatible with existing frequency uses. Increasing the number of FSS frequencies available for NGSO ESIMs will help to dramatically increase the capacity for consumers on the move, so they can conduct business and stay in touch with family on airplanes, ships and trains.

III. ESIM APPLICANTS MUST SHOW THEY COMPLY WITH RELEVANT EIRP LIMITS AND WITH THE COMMISSION'S SELF-MONITORING AND NETWORK CONTROL REQUIREMENTS

The Commission should require that applicants for new or modified NGSO ESIM authorizations demonstrate how they will comply with the Commission's self-monitoring and network control requirements and their authorized EIRP limits. While SES does not oppose Kymeta's proposal to streamline NGSO blanket license processes,²² the Commission must require that any such filing include the relevant technical showings for NGSO ESIMs, such as a demonstration that the licensees will meet the authorization's stated EIRP limit. Under this approach, an entity holding GSO ESIM blanket authority could modify its authority to include NGSO ESIM operations, but would need to provide the same technical showings as a new applicant. That modification application would then be subject to the same public notice process as a newly filed blanket license application, allowing for interested parties to assess the sufficiency of the required showing.

SES also continues to support the retention of the Commission's self-monitoring and network control requirements for ESIMs communicating with NGSO systems to ensure that they comply with their authorized EIRP density and can terminate transmissions in the case of harmful interference.²³ The network control and self-monitoring requirements are essential to

²² Kymeta Comments at 3-4.

²³ SES Comments at 9-10.

maintaining the NGSO-NGSO and NGSO-GSO sharing environments. SES does not oppose Kepler's request that the Commission clarify that "operations without bent-pipe architecture may implement alternate safety measures,"²⁴ but the Commission should retain the NCMC and self-monitoring requirements even if it permits operators to demonstrate in their applications alternative methods that they will use to comply with these requirements. Such applicants should, for example, be obligated to demonstrate their ability to terminate operations in the event of interference and specify a 24/7 point of contact for the network.

IV. NO ADDITIONAL MEASURES ARE NEEDED TO PROTECT RAS OPERATIONS

The record in the Commission's previous ESIM proceeding demonstrates that there is no need for imposing constraints on NGSO ESIMs to protect RAS operations.²⁵ The Commission's existing rules already protect RAS operations to the extent necessary. As SES has previously explained, the Commission's ESIM framework retains the existing requirements for coordination of ESIM networks in the 14.47-14.50 GHz frequencies with RAS observatories. Similarly, there is no threat of interference to RAS operations in the 10.68-10.7 GHz band adjacent to the ESIM downlink in 10.7-10.95 GHz or to RAS use of the 18.6-18.8 GHz bands because these frequencies are space-to-Earth frequencies in which ESIMs only receive signals. As such, there will be no ESIMs transmitting in these frequencies and no threat of interference.

²⁴ Kepler Comments at 2.

²⁵ See, e.g., Reply Comments of SES Americom, Inc. and O3b Limited, IB Docket No. 17-95 (filed Aug. 30, 2017) at 7-8.

V. CONCLUSION

The Commission should adopt its proposals to expand its ESIMs rules to include NGSO constellations consistent with the discussion above.

Respectfully submitted,

/s/ Petra A. Vorwig

Senior Legal and Regulatory Counsel
SES Americom, Inc.
1129 20th Street, NW, Suite 1000
Washington, DC 20036
(202) 478-7143

Of Counsel

Karis A. Hastings
SatCom Law LLC
1317 F Street, N.W., Suite 400
Washington, D.C. 20004

/s/ Suzanne Malloy

Vice President, Regulatory Affairs
O3b Limited
1129 20th Street, NW, Suite 1000
Washington, DC 20036
(202) 813-4026

Noah Cherry

Legal and Regulatory Counsel
O3b Limited
1129 20th Street, NW, Suite 1000
Washington, DC 20036

March 13, 2019