

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

In the Matter of)	
)	
Expanding Flexible Use in Mid-Band Spectrum)	GN Docket No. 17-183
Between 3.7 and 24 GHz)	

COMMENTS OF SES AMERICOM, INC.

SES Americom, Inc. (“SES”) submits these comments in response to the Notice of Inquiry in the above-captioned proceeding, which seeks input on potential expanded terrestrial use of spectrum in the 3.7-24 GHz range, with a focus on the conventional C-band frequencies and the adjacent 6.425-7.125 GHz band.¹ SES is a member of the Satellite Industry Association (“SIA”) and fully supports the SIA comments on the NOI.² SES is filing separately to provide its perspective as a major supplier of C-band space segment and to highlight the importance of continued access to these frequencies for SES’s satellite service customers.

As SIA explains, the unique characteristics of C-band spectrum have made satellite services in these frequencies indispensable for users who require extremely high reliability and a nationwide reach. To meet this demand, SES and others have invested billions of dollars in C-band space station capacity, and our customers have expended tens of millions of dollars for the associated ground equipment. In order to preserve the value of this investment and prevent disruption of services to the military and civilian agencies, media and nonmedia businesses, and tens of millions of households that directly or indirectly rely on C-band satellite service, the

¹ *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017) (the “NOI”).

² Comments of the Satellite Industry Association, GN Docket No. 17-183, filed Oct. 2, 2017 (the “SIA Comments”).

Commission must ensure that its rules and policies continue to protect satellite service access to C-band frequencies and accommodate the operational requirements of satellite systems.

Given the intensive use of C-band frequencies for satellite service, introducing new co-frequency, co-coverage terrestrial operations poses significant challenges, particularly in the downlink band segment. C-band receive earth stations are highly vulnerable to terrestrial interference and must be separated from terrestrial transmitters by tens or even hundreds of kilometers to prevent degradation of the received signal. In the uplink bands, the primary concern is the risk that the cumulative power produced by large numbers of terrestrial devices would create an aggregate interference problem at the satellite receiver. In short, the deployment density and propagation characteristics of C-band satellite networks make it extremely difficult to add new terrestrial operations without disrupting satellite services. Nevertheless, SES will carefully evaluate any proposed alternative approaches to permit expanded use of C-band spectrum by terrestrial players, while protecting the ability of SES and its customers to continue delivering the high-reliability C-band satellite services that are so essential to the nation's communications backbone.

I. SES C-BAND SATELLITES PROVIDE A VARIETY OF CRITICAL, HIGH-RELIABILITY SERVICES IN RESPONSE TO CUSTOMER DEMAND

The SIA Comments highlight the multiple industries, government agencies, and public safety services that depend on C-band satellite networks.³ Content delivery to broadcasters and multichannel video programming distributors (“MVPDs”) is a case in point. SES operates a “cable neighborhood” – a cluster of satellites located in a central portion of the orbital arc (SES-1 at 101° W.L., SES-3 at 103° W.L., and AMC-18 at 105° W.L.) that carry a significant share of

³ *Id.*, Section I.

the programming delivered to cable headends. SES has worked with its customers to enhance the utility of this configuration, and many cable headends now are equipped with a triple-feed antenna that allows reception of programming from all three satellites in the neighborhood without the need to repoint the antenna towards individual orbital locations. This arrangement permits customers to maximize the return on their investment in C-band facilities and capacity. It also ensures that cable headend operators can quickly access capacity available at any of the three orbital locations in the event one of the satellites has a technical issue.

SES is also committed to bringing its customers the latest technological advances. Thirty-five MVPDs with roughly 30 million subscribers are participating in an SES trial of 4K ultra high definition (“UHD”) video, and three of these operators have initiated commercial services. The SES offering relies on dedicated satellite bandwidth, which provides higher quality than Internet-delivered 4K. Moreover, because of the large coverage areas of C-band satellites, this state-of-the-art programming quality can be made available nationwide, including in areas where fiber is unavailable. In addition to major MVPDs such as Verizon and Cincinnati Bell, participants in the trial include small regional cable operators based in Ketchikan, Alaska, rural Douglas County, WA, and the Wisconsin Dells.⁴

Only C-band satellite frequencies are capable of providing the high availability levels that video distribution customers demand. Rain fade can materially affect satellite operations in higher frequency bands. Viewers, however, expect to receive the same picture quality whatever the weather outside.

The current Commission policy in favor of full-band, full-arc earth station licensing is essential to SES’s ability to satisfy customer demand for service reliability and continuity. In

⁴ See <http://www.sesnewsletter.com/september/>.

order to ensure uninterrupted operations, content distributors typically pay a premium for protected satellite service. Under these arrangements, SES is obligated to immediately make available restoration capacity in the event of an outage affecting the customer's primary transponder or satellite. To meet its contractual commitments to protected users, SES must reconfigure the traffic loading on multiple satellites, reclaiming bandwidth from customers with preemptible service and then working to identify space segment for the preempted customers as well. This complicated series of steps can be implemented quickly and seamlessly only if SES customers have the flexibility and authority to reorient their antennas and change band segments as needed to receive service over the designated restoration satellite and frequencies.

As SES has explained, it has recent direct experience with the complexities of service restoration because its AMC-9 satellite experienced a severe and unexpected anomaly in June.⁵ A C-band customer had been using the satellite to distribute video programming to more than one hundred affiliates nationwide, and restoring service to that customer required repointing each of those affiliates' receive antennas. Absent the regulatory flexibility to use the full C-band spectrum and reorient the antennas as needed toward the designated follow-on satellite, reestablishing service to that customer on a timely basis would have been impossible.

In addition to video programming delivery, SES C-band capacity enables a range of other critical commercial and government services. A number of syndicated radio networks use the AMC-18 spacecraft for audio content distribution. Weather data and forecasts developed by the National Weather Service are distributed in near-real time using SES-1. OptimEra in Alaska has purchased a full 72 MHz transponder on NSS-9 to enable a 10-fold speed increase in broadband

⁵ Opposition of SES Americom, Inc., RM-11791, filed Aug. 7, 2017, at 2-3.

connectivity available in the remote port city of Unalaska and neighboring towns and islands across the southwest part of the state.

Through these services, SES customers are able to make the most of the broad reach and unmatched reliability of C-band satellite operations. The ultimate beneficiaries are U.S. consumers, who enjoy a diverse array of news, entertainment, and sports programming, have access to critical weather and emergency information, and enjoy greater connectivity that extends to the most remote areas of the country.

II. THE TECHNICAL AND PRACTICAL OBSTACLES TO GREATER TERRESTRIAL SHARING OF C-BAND SPECTRUM ARE SIGNIFICANT

SES understands that C-band spectrum is attractive to terrestrial service interests, but the combination of an installed base of widely deployed satellite network facilities and the uncompromising laws of physics makes it extremely challenging to add terrestrial services without disrupting critical satellite service offerings. As SIA observes, both studies by the International Telecommunication Union and real-world experience confirm that introducing terrestrial mobile services in C-band downlink frequencies is a recipe for crippling interference to satellite services because necessary separation distances to the receive earth stations cannot be maintained.⁶ Although terrestrial point-to-point fixed services employ highly directional antennas that reduce the breadth of their interference footprint, terrestrial transmitters operate at power levels designed to close links tens of kilometers long and consequently must be separated from receive earth stations by significant distances as well.⁷ Fixed point-to-multipoint services,

⁶ SIA Comments, Section IV.

⁷ *Id.*

on the other hand, create an interference footprint similar to that of mobile service base stations, as they are no longer highly directional but seeking to cover a wide area.

The large numbers and broadly scattered locations of C-band satellite receive earth stations leave little or no opportunity to deploy new terrestrial facilities at sufficient distances to avoid interference problems. These issues are exacerbated by the fact that thousands of receive earth stations are unregistered. As a result, the Commission lacks essential information regarding the total numbers and specific locations of ground segment facilities that must be protected to maintain current levels of satellite services.

As SIA acknowledges, the challenges associated with exploring additional potential uses of satellite uplink spectrum in the conventional C-band and adjacent upper 6 GHz band segment are less substantial, provided the Commission can develop a satisfactory framework to prevent harmful aggregate interference at the satellite receiver and allow deployment of future FSS earth stations.⁸ Such a framework will need to mitigate the risk of unauthorized alteration of terrestrial equipment, particularly if the Commission decides to permit unlicensed devices to operate in this spectrum.

The complex issues associated with C-band sharing are well known to the Commission, which has fully considered prior challenges to the C-band spectrum sharing framework submitted by the Fixed Wireless Communications Coalition (“FWCC”). After that review the Commission declined to adopt any changes in its rules or policies, finding that no solution had been proposed that would allow greater access for terrestrial services while still accommodating

⁸ *Id.*, Section V.

the service-specific operational and business requirements of satellite networks.⁹ As both SIA and SES have explained at length, neither the most recent proposal of the FWCC nor the petition filed by the Broadband Access Coalition (“BAC”) alters that situation.¹⁰

SES will not repeat those arguments here. Suffice it to say that the requests by the FWCC and the BAC to eliminate full-band, full-arc licensing of earth stations would remove flexibility that satellite operators need in order to restore service, address interference, respond to emergencies, and achieve coordination and would not produce any countervailing public interest benefits. In that respect, the FWCC and BAC petitions simply follow in the footsteps of earlier submissions seeking to radically shift the sharing rules in favor of terrestrial systems without making any meaningful attempt to meet the legitimate needs of satellite service providers and their customers.

SES emphasizes that it will carefully evaluate any proposed more intensive terrestrial use of C-band spectrum from a perspective of ensuring that SES can continue to use its substantial investment in satellite facilities for the benefit of its customers and their end users. SES will closely review the comments in response to the NOI with that standard in mind.

⁹ *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum*, Second Report and Order, 17 FCC Rcd 2002, 2007, ¶ 12 (2002).

¹⁰ See Petition to Dismiss or Deny of the Satellite Industry Association, RM-11778, filed Jan. 9, 2017; Petition to Dismiss or Deny of SES Americom, Inc., RM-11778, filed Jan. 9, 2017; Reply of the Satellite Industry Association, RM-11778, filed Jan. 24, 2017; Reply of SES Americom, Inc., RM-11778, filed Jan. 24, 2017; Opposition of the Satellite Industry Association, RM-11791, filed Aug. 7, 2017; Opposition of SES Americom, Inc., RM-11791, filed Aug. 7, 2017; Reply of the Satellite Industry Association, RM-11791, filed Aug. 22, 2017.

III. CONCLUSION

For the foregoing reasons, SES urges the Commission to protect and preserve the essential satellite services provided in C-band spectrum.

Respectfully submitted,

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