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

In the Matter of:	)	
	)	
Modernizing Spectrum Sharing for Satellite Broadband	)	SB Docket No. 25-157
	)	
	)	

REPLY COMMENTS OF THE NATIONAL ASSOCIATION OF BROADCASTERS

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)[1] submits reply comments on the above-captioned Notice of Proposed Rulemaking.[2] Our comments focus on the continued protection of Ku-band services provided by geostationary orbit (GSO) satellites. NAB appreciates that new non-geostationary orbit (NGSO) satellite operators have launched satellite mega-constellations. We recognize as well that the Commission has repeatedly suggested that Ku-band may be a substitute for current media applications in C-band.[3] While NAB does not agree that Ku-band offers equivalent utility to C-band, we believe that Ku-band will be an important component in the design of alternatives to C-band. Nevertheless, legacy Ku-band GSO satellites continue to provide thousands of users, including many broadcast users, with critical applications. The FCC

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1 The National Association of Broadcasters (NAB) is the nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

2 *Modernizing Spectrum Sharing for Satellite Broadband,* Notice of Proposed Rulemaking, SB Docket 25-157, FCC 25-23 (rel. Apr. 29, 2025) ("NPRM").

3 *In the Matter of Upper C-band (3.98 to 4.2 GHz)*, Notice of Inquiry, GN Docket 25-59 ¶ 10 (Rel. Feb. 28, 2025); *see also In the Matter of Applications of SES S.A. and Intelsat S.A. For Consent to Transfer Control of Licenses and Authorizations*, Memorandum and Order, SB Docket 24-267 ¶ 27 (July 11, 2025).

must ensure that these GSO systems are not degraded.

Radio and television broadcasters depend on reliable GSO operations, and it is critical that their operations have primacy in the case of interference. While petitioners claim that launching new NGSO systems with modified sharing requirements will not degrade the signals of GSO systems, we believe petitioners' claims of non-interference may be too rosy. If the Commission decides to take any action, we believe it would be prudent for it to continue to participate in the ITU process and adopt rules that follow that process. If the Commission chooses to move ahead of the ITU process, we ask that it not take any irreversible steps given the very real chance that the petitioners' claims of non-interference are overstated. Finally, any changes that are made should ensure that there is no loss of service among critical GSO systems, especially at a time when the Commission will be reallocating at least 100 MHz of C-band spectrum, likely necessitating additional reliance on the Ku-band by broadcasters. We encourage the Commission to proceed cautiously to ensure that critical GSO operations are not disrupted by the operation of NGSO systems with altered spectrum sharing requirements.

II. KU-BAND GSO OPERATIONS MUST HAVE PRIMACY IN CASE OF INTERFERENCE

According to FCC databases, at least 21 major broadcast licensees also hold licenses in the Ku downlink band (11.7 to 12.7 GHz).[4] This figure likely will increase, perhaps dramatically, if the Commission successfully auctions a portion of Upper C-band because many broadcast users presently in Upper C-band are likely to seek to maintain satellite connectivity (either as a primary or a backup system) if they are forced to vacate C-band. As a result, NAB shares SES's concerns that "[a]ny unilateral premature weakening or altering of [the existing Ku-band EPFD] limits would increase NGSO-into-GSO interference risk and disrupt critical GSO services on

[4] This figure does not include the large number of receive-only facilities at broadcast stations.

which consumers, enterprises, and governments depend."[5]

NAB takes no position at this time on whether or what specific interference limits or methods might be acceptable in the future for NGSO-GSO spectrum sharing at Ku-band. But given the large installed base of Ku-band GSO broadcast facilities and applications, any interference or material degradation of GSO links from NGSO systems must be promptly remedied in favor of protecting the GSO system. GSO systems must have primacy in determining interference rights, and NGSO systems must be required to immediately take action, up to and including cessation of operations, to eliminate interference to GSO receivers. Because of the critical and timely nature of broadcast operations, GSO satellite user requests to NGSO operators for information or mitigation actions require immediate response and must not be contingent on lengthy technical measurements or labored assessments of "how long and how bad" the interference is. Building on NGSO operators' assurances that the likelihood of interference to GSO receivers is extremely low, this requirement can serve as a mutual safeguard, providing added confidence for all parties that helps demonstrate the strength of NGSO systems. Ultimately, this could benefit both NGSO and GSO operators. Indeed, maintaining these safeguards on GSO systems is critical as some alternative proposals designed to manage interference have significant technical flaws that limit their reliability.

III. USE OF ACM IS NOT POSSIBLE FOR MOST BROADCAST SYSTEMS

As the Commission considers interference limits, it is important to note that the NPRM's proposal to use Adaptive Coding and Modulation (ACM) has limited applicability to broadcast applications, which are typically one-way transmissions. The NPRM suggests that the use of ACM on GSO links may be useful in increasing spectrum-sharing opportunities between GSO

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[5] Comments of SES S.A. and Affiliates, SB Docket 25-157 at 2 (July 28, 2025) (SES Comments).

and NGSO systems.[6] ACM inherently relies on a bidirectional circuit to provide feedback to the uplink that degradation is occurring at an affected downlink, so that the uplink can "down-shift" to a lower (more robust) effective transmission rate. In a broadcast distribution system, the use of ACM would require "return paths" from every single downlink site to every possible uplink; in most cases these return paths do not exist. Even if they did exist, GSO satellite systems have large latencies. As a result, negotiating a suitable modulation and coding (MODCOD) mode would be an unacceptably lengthy process that would disrupt the continuity of the content being broadcast. Additionally, a single downlink reporting degradation (due to interference, rain fade, or some other factor) would cause the uplink to change mode, which would adversely affect every downlink site (and there may be hundreds), not just the single downlink requiring mitigation. The ACM shift to a more robust MODCOD mode will always be adverse because the leased bandwidth available on the GSO satellite is fixed, so by the Shannon-Hartley Theorem,[7] fewer bits transmitted as a result of ACM will always result in reduced quality of service (QOS) (*i.e.,* poorer video and audio) delivered to the station and, ultimately, to the consumer. Often, program providers contractually mandate a specific bit rate or related QOS metric to ensure broadcast quality delivery, which, because of its reduced QOS, would make ACM a contractual non-starter for many broadcasters. As a result, the Commission should proceed cautiously as it considers any rule changes based on inapposite technological workarounds.

IV. THE FCC SHOULD PROCEED CAUTIOUSLY AND PARTICIPATE IN THE ITU PROCESS

NAB agrees with SES that any rule that the FCC changes "should follow – not precede –

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[6] NPRM ¶¶ 20, 25, 28.

[7] C.E. Shannon, "Communication in the presence of noise," 37:1 *Proceedings of the Institute of Radio Engineers*, 10, 10–21 (1949).

the related ITU studies."[8] Any changes in the existing Ku-band sharing framework are likely to result in more Ku-band NGSO satellites in the sky, which is likely to result in greater interference to GSO receivers due to the aggregation of interfering energy from multiple satellites. NAB believes that the two types of satellite systems can share spectrum cooperatively, as they have done so for many years under the present regime. But modifying the methods and parameters for sharing is clearly controversial, and if the FCC takes unilateral action, it risks creating interference that potentially has global significance. Technical analyses and policy discussions at the ITU are already well underway,[9] and the FCC should view this activity as an opportunity to drive consensus internationally -- not to diverge from it. Given the global uncertainty around the best way to manage interference to GSO systems from NGSO systems, the Commission should avoid taking any action that can't be reversed.

V. ANY ACTIONS TAKEN MUST BE REVERSABLE IN THE EVENT OF INTERFERENCE

As discussed above, NAB believes that any changes in the sharing regime between GSO and NGSO systems should await resolution during the ITU process. If the Commission nonetheless decides to move unilaterally, it must ensure that NGSO systems built to the new protection specifications can revert to the present requirements in the event of interference. From the initial comments, technical studies demonstrating protection of GSO downlink receivers from harmful aggregate (and single satellite) NGSO interference are inadequate or at least controversial. It is well said that "moving quickly" carries the risk of "breaking things." In this case, NAB agrees with Astranis that American national security is at risk if Ku-band

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[8] SES Comments at 2.

[9] *See, e.g., Technical studies in response to WRC-23 minutes on Article 22 EPFD limits without any regulatory consequences*, ITU Working Party 4A Document 567, Annex 31 (May 15, 2025).

services are substantially degraded as a result of changed NGSO sharing requirements.[10] It should be well within the engineering design capabilities of NGSO operators to provide a reversion capability in the event some factor in the engineering interference studies turns out to be incorrect or missed entirely. At bottom, the Commission should be wary of adopting any inflexible rules that could compromise GSO services.

VI. NO CHANGES SHOULD BE MADE THAT WOULD REDUCE GSO SERVICE LEVELS

Because they possess fewer failure risks, it is critical that the Commission maintain GSO systems' current service levels. GSO systems are in less congested, static orbits. As a result, they carry lower collision and debris risks. Indeed, a single GSO satellite can provide national coverage (or greater). That means there are fewer points of failure. GSO satellites also operate 2-3 times as long as NGSO satellites, reducing dependence on regular replacements and the associated risks of congestion and failure in the launch segment.

By contrast, Low Earth orbit systems (*i.e.*, NGSO systems) require up to thousands of satellites to provide continuous coverage. With the greater number of satellites in orbit, that increases the failure risks due to collisions, malfunctions, or debris. A Kessler Syndrome[11] event is an extreme example of this risk. And if several satellites fail, that will create coverage gaps. NGSO systems also require many circuits and many links, each of which carries some likelihood of failure, which, in turn, reduces their overall reliability.

Comparing the reliability risks associated with GSO systems and NGSO systems, the FCC must maintain the high availability, capacity, and reliability of GSO systems in the likely event of partial or complete failure of NGSO systems.

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[10] Comments of Astranis Space Technologies Corp., SB Docket 25-157 at 1 (July 28, 2025).

[11] *See* Mike Wall, *Kessler Syndrome and the space debris problem*, Space.com (July 14, 2022), https://www.space.com/kessler-syndrome-space-debris.

VII. CONCLUSION

For decades, GSO satellites have provided the foundation for reliable contribution and distribution services supporting broadcasters, as well as public safety entities, government users, and other industries. Satellite operations at Ku-band remain critical, especially as the Commission reallocates portions of C-band spectrum. Indeed, broadcasters will increasingly depend on Ku-band to maintain continuity of service. NAB appreciates the innovation and investment NGSO operators bring to the marketplace. Nevertheless, protecting the reliability of incumbent GSO services must remain the Commission's foremost priority.

The ITU process already underway provides the appropriate venue to evaluate complex technical issues and to develop harmonized, global standards for sharing. The Commission should therefore proceed cautiously, ensure that any rules it may adopt are fully reversible, and avoid unilateral steps that risk unintended interference consequences. To the extent that NGSO operators are correct that interference to GSO receivers will be vanishingly rare, then safeguards to protect GSO systems will impose little or no burden, while providing confidence to all stakeholders.

Ultimately, any changes to Ku-band sharing must ensure that GSO systems retain primacy in the event of interference, that service levels are not diminished, and that broadcast applications remain robust and reliable. By anchoring its decisions in these "do no harm" principles, the Commission can encourage innovation from NGSO systems while preserving the trusted GSO services upon which broadcasters continue to rely.

Respectfully submitted,

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