

Consultation response form

Please complete this form in full and return to NGSO.licensing@ofcom.org.uk.

Consultation title	Amazon Kuiper UK Limited application for a non-geostationary gateway earth station licence
Full name	[REDACTED]
Contact phone number	[REDACTED]
Representing (delete as appropriate)	
Organisation name	Viasat, Inc.
Email address	[REDACTED]

Confidentiality

We ask for your contact details along with your response so that we can engage with you on this consultation. For further information about how Ofcom handles your personal information and your corresponding rights, see [Ofcom's General Privacy Statement](#).

Your details: We will keep your contact number and email address confidential. Is there anything else you want to keep confidential? Delete as appropriate.	Your name.
Your response: Please indicate how much of your response you want to keep confidential. Delete as appropriate.	None.
For confidential responses, can Ofcom publish a reference to the contents of your response?	Yes / No

Question	Your response
Question 1: Do you anticipate this NGSO gateway earth station will pose coexistence challenges to existing NGSO systems?	Confidential? – N Ofcom recently sought comment in connection with its consultation regarding Amazon’s application for earth station network license authorisation. In that context, Viasat raised concerns¹ with respect to: (i) whether Amazon’s Kuiper NGSO system is capable of coexisting with other NGSO systems; and (ii) whether that system would be able to comply with applicable equivalent power flux density (EPFD) limits across all of the ITU filings that comprise its NGSO system, considered together. These concerns continue to exist and are relevant to this Consultation² on Amazon’s request for NGSO gateway license. Viasat incorporates by reference its prior analysis and provides additional information and analytical material to reflect the latest ITU work. In light of this new information, Viasat urges Ofcom to deny Amazon’s request for a further license. In its analysis of coexistence with existing NGSO systems, Amazon again uses an assessment based on weighted time-average throughput degradation³. Viasat have previously raised concerns regarding this methodology. Ofcom in its previous statement on Kuiper’s earth station network license merely states that they “consider these metrics to be a reasonable proxy for demonstrating coexistence with others” because they are supposedly “widely used by the space sector in various spectrum bands as suitable for evaluating interference impact” In truth, there is no consensus with respect to the use of these methodologies as evidenced by the disagreements captured in the form of editors notes in an ITU Working Document – Annex 43 to WP4A chair’s report 4A/ 567, Working Document Towards Preliminary Draft New Report ITU-R S.[Interference-NGSO-NGSO/GSO]⁴. Together with the absolute

¹ See Viasat Response on Ofcom Consultation: Amazon Kuiper Services Europe SARL application for a non-geostationary earth station network license, <https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-3-4-weeks/186639---kuiper-application-for-an-ngso-earth-station-network-licence/responses/viasat.pdf?v=390540>.

² See Ofcom Consultation: Amazon Kuiper UK Limited application for a non-geostationary gateway earth station license, <https://www.ofcom.org.uk/spectrum/space-and-satellites/consultation-amazon-kuiper-uk-limited-application-for-a-non-geostationary-gateway-earth-station-licence>.

³ See Annex 1: Amazon Kuiper NGSO gateway license – Additional information, <https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-3-4-weeks/amazon-kuiper-uk-limited-ngso-app-july-2025/application-documents/annex-1-kuiper-ngso-gateway-licence-additional-information.pdf?v=399412>.

⁴ See Annex 43 to WP4A chair report 4A/567, dated 15.05.2025, WORKING DOCUMENT TOWARDS PRELIMINARY DRAFT NEW REPORT ITU-R S.[INTERFERENCE-NGSO-NGSO/GSO] on Possible Examples

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	unavailability increase criteria, these methodologies certainly have not been established as “suitable” for evaluating impact of interference. ITU-R Recommendation S.2131, which is referenced by Amazon in their additional information document, sets forth a method for determining performance objectives for satellite hypothetical reference digital paths utilizing ACM. This recommendation defines the average loss in throughput with the following formula: $\text{Throughput} = \text{Channel rate} \times \text{Time}$ $\text{Lost throughput} = \text{Maximum available throughput} - \text{Delivered throughput}$ $\% \text{ degraded throughput} = (\text{Lost throughput} / \text{maximum available throughput}) \times 100$ Critically, however, this recommendation does not specify the time period over which this criterion should be computed, which is addressed in Note 4 of the ITU-R Recommendation S.2131. Note 4 states that the time-average throughput over any year does not provide sufficient information on link performance for specific time percentages for any given time period during the year. Additional performance requirements in terms of throughput/spectral efficiency, as a function of the year’s percentage, also need to be considered in the overall performance assessment of links using ACM, warranting further studies. In addition, Resolution 769 (WRC-19) also calls for further studies on the selection and use of C/N objectives, and the necessity of specifying one or more C/N objective points at associated percentages of time, with regard to the GSO link performance. Clearly, the annual average throughput criteria should not be the sole determinant for assessing NGSO emissions impact on NGSO or GSO link performance. Several key contributions have been submitted to the ITU, particularly at Working Party 4A, aiming to highlight and address these concerns. Notably: • Document 4A/270⁵, assessing the impact of non-GSO systems on GSO networks using average throughput degradation criteria, demonstrates that long-term interference significantly impacts Ka-band GSO networks.

of methodologies to assess interference levels during coordination when non-geostationary FSS satellite systems for frequency ranges between 10.7 and 52.4 GHz are involved,
https://www.itu.int/dms_ties/itu-r/md/23/wp4a/c/R23-WP4A-C-0567!N43!MSW-E.docx.

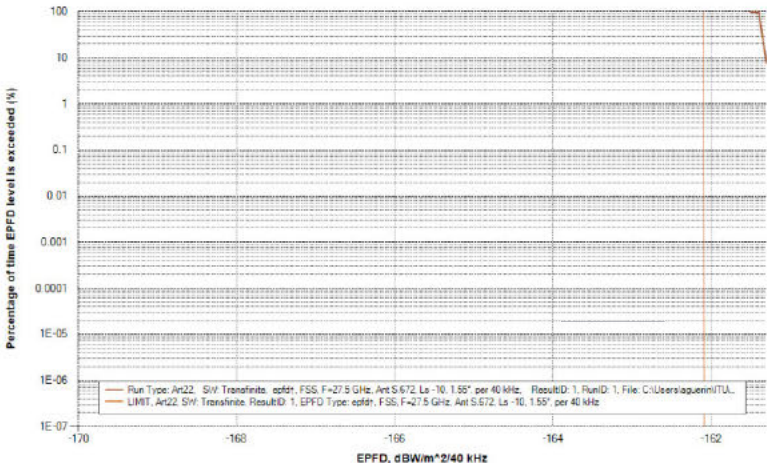
⁵ See <https://www.itu.int/md/R23-WP4A-C-0270/en>.

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	The degradation in spectral efficiency, with and without ACM, indicates that using this type of criterion is inadequate for protecting GSO networks from prolonged non-GSO interference. Document 4A/826⁶ (WRC-19 cycle) presents an example where an FSS link using ACM, factoring in average degradation in spectral efficiency, shows a 1.86% degradation, within the 3% single-entry limit. Certain periods during the year, however, see degradation in spectral efficiency exceeding 23%, far surpassing the acceptable 3% threshold for 99% of the year. These studies unequivocally indicate that the annual average throughput degradation criteria defined in the ITU Radio Regulations No. 22.5K and 22.5L fails to appropriately and reliably assess the impact of NGSO systems on GSO networks or NGSO systems. A more comprehensive assessment method, taking into account more granular time-specific impacts, is imperative to ensure appropriate coexistence between NGSO systems and to limit long-term NGSO system interference. On previous occasions, Ofcom has clarified that their NGSO licensing requirements are developed to reinforce ITU process and methodologies rather than replacing them with different criteria on a national basis. In the case of the short-term impact of Amazon's NGSO system, there have been no studies conducted on the absolute unavailability degradation methodology in the ITU. Rather, proposals on this methodology have been either opposed outright at ITU Working Party 4A or invited calls for studies⁷ on the basis that it does not adequately protect the interference recipient system and caps its availability performance with no room for further improvements. Implementing this approach would almost certainly result in frequent outages and a degraded user experience for GSO networks, irrespective of their architectural design. Resolution 770 and No. 22.5L of the ITU Radio Regulations provide <i>relative</i> degradation to unavailability as a criteria to assess short-term interference impact from NGSO systems. If Ofcom wishes to deviate from ITU standards, then we urge Ofcom to conduct its own independent assessment of the new "absolute" unavailability criteria on both single-entry and aggregate basis and how it could impact both GSO networks and NGSO systems.

⁶ See <https://www.itu.int/md/R19-WP4A-C-0826/en>.

⁷ See Annex 46 to 4A/567, dated 15.05.2025, Working document towards a preliminary draft new Recommendation on maximum allowable aggregate interference levels from time-variant sources from other services into fixed-satellite service links, <https://www.itu.int/md/R23-WP4A-C-0567/en#:~:text=and%20related%20analyses-,Word,-339126%20bytes>.

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	See also Answer to Question 4.
Question 2: Are the measures set out by the applicant to enable coexistence with future NGSO systems reasonable?	Confidential? – N Please see response to Question 1.
Question 3: Do you expect that granting this NGSO gateway licence would benefit or harm competition between NGSO services in the UK? Please provide details.	Confidential? – N NGSO operators, collectively, are subject to limits on the aggregate levels of EPFD they may generate towards GSO networks. Granting this license without any process or methodology to share the aggregate EPFD budget amongst multiple NGSO systems would cause significant uncertainty, chill investments in existing and future NGSO systems and harm competition. SpaceX is currently authorized by the Federal Communication Commission (FCC) to operate two NGSO systems, each of which appears to exceed the existing “single-entry” (i.e., per-system) EPFD limits by significant amounts. Together with Amazon Kuiper, this means that there are already limited opportunities for other NGSO systems to operate within the total NGSO EPFD interference “budget.” Even if these systems operate just under the long-term single-entry EPFD limits, they would consume almost the entire NGSO EPFD long-term interference budget.
Question 4: Do you have any additional concerns or comments regarding the application?	Confidential? – N As mentioned in Amazon’s license application and the Consultation document, Amazon operates 3232 “Gen1” NGSO satellites under three ITU filings – USASAT-NGSO-8A, USASAT-NGSO-8B, USASAT-NGSO-8C. These three filings have been <i>independently</i> evaluated by the ITU for EPFD compliance individually and given a “favourable finding”. This analysis provides little insight into whether Kuiper’s “Gen1” satellites comply with applicable EPFD limits when considered as a whole—i.e., when viewed as part of a single system, which is how these satellites operate. For obvious reasons, combining the EPFD

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	levels of these three ITU filings results in significantly higher levels of interference into GSO networks. The following analysis shows that, when the three filings are combined into one to represent the entire Kuiper NGSO system, the EPFD levels generated by combined “Gen1” satellite operations exceed the EPFD limits (see Figure 1).  <i>Figure 1. Results of the evaluation of the uplink EPFD in the Ka-band using an aggregate database based on the combined filings from Amazon’s NGSO system.</i> This analysis demonstrates that Ofcom cannot solely rely on the ITU to perform this critical analysis because the current methodology and process used by the ITU, particularly under ITU Recommendation S.1503, has notable known limitations and gaps. It is a requirement set by Ofcom that NGSO systems considered for authorisation to operate in the UK must meet Article 22 EPFD limits. In addition to the above, there is no demonstration on whether Amazon Kuiper complies with the ITU Radio Regulations Article 22 downlink EPFD limits in the UK. As Viasat has mentioned on numerous occasions, the analysis provided by the ITU is limited to assessing EPFD levels based on the data supplied in a specific filing, which often only considers a narrow set of scenarios—such as a single earth station location and a GSO satellite position. This approach is inherently limited and does not capture the full range of operational conditions. For all the reasons above, Viasat continues to encourage Ofcom to conduct an independent assessment of potential for interference, from a single NGSO system and all NGSO systems collectively, within

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	UK's national territory that are not covered by the limited assessments performed by the BR regarding ITU filings for the NGSO system. Such an assessment should be required from NGSO operators to demonstrate compliance with the single-entry and aggregate EPFD limits prescribed in the ITU Radio Regulations Article 22 and ITU Resolution 76, respectively. This should include: ○ A demonstration for the Amazon Kuiper NGSO constellation as a whole. ○ A demonstration for the specific portions of the Amazon Kuiper NGSO constellation proposed to serve the UK (including the exact satellite altitudes and inclinations proposed to be used). A demonstration for a suitable number of representative geographic locations within the UK, including at and around the proposed Amazon gateway location, and for all GSO satellite networks serving, or proposed to serve UK. ○ A demonstration of how the Amazon Kuiper NGSO system avoids interference to GSO networks created by numerous NGSO satellite antenna sidelobes, particularly when phased array antennas are employed. ○ A demonstration for the operation of the Amazon Kuiper NGSO constellation alongside the operation of all other co-frequency NGSO constellations serving UK. ○ Information on the ITU filings under which each of the NGSO systems seek to operate in UK and where the NGSO system operate under multiple filings, each application should contain EPFD input files (<i>e.g.</i>, SRS and mask database) that represent their system as a whole and that are consistent with their ITU submission. To ensure that the expected interference evaluated based on the above assessment is not exceeded during Amazon Kuiper NGSO operations, the following licensing conditions are necessary: 1. Amazon Kuiper UK Limited as NGSO operator shall operate its system as a single constellation for purposes of the EPFD limits, no matter how many ITU filings it may seek to operate under. The Amazon Kuiper UK Limited shall confirm that its deployed NGSO system is fully consistent with its ITU filings. 2. Amazon Kuiper UK Limited as NGSO operator shall comply with all the parameters provided in its ITU filing, specifically: • Maximum number of co-frequency beams serving a specific location in UK, commonly known as "Nco".

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	• Minimum GSO arc avoidance angle, commonly known as “alpha angle.” • The downlink power flux density mask (PFD mask) and uplink EIRP density mask, taking into account the actual characteristics of NGSO system and earth stations as deployed, including the radiation pattern of its satellite antenna.
Question 5: Do you agree with our assessment of the potential impact of our proposal on specific groups of persons?	Confidential? – N Viasat has not formulated a view with respect to this issue at this point in time.
Question 6: Do you agree with our assessment of the potential impact of our proposal on the Welsh language?	Confidential? – N Viasat has not formulated a view with respect to this issue at this point in time.
Please tell us how you came across this consultation.	☒ Email from Ofcom ☐ Saw it on social media ☐ Found it on Ofcom's website ☐ Found it on another website ☐ Heard about it on TV or radio ☐ Read about it in a newspaper or magazine ☐ Heard about it at an event

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