12 November 2024

Mr. Mandla Mchunu

Independent Communications Authority of South Africa (ICASA)

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Centurion

South Africa

**Submitted Electronically:** satlicensing@icasa.org.za

**Subject: Consultation on the proposed new Licensing Framework for Satellite Services**

Dear Mr. Mchunu

Viasat welcomes the opportunity to participate in the public consultation on the proposed new Licensing Framework for Satellite Services (“Satellite Licensing Framework”).

Viasat commends the Independent Communications Authority (ICASA) on its efforts to develop the Satellite Licensing Framework in a streamlined and transparent manner conducive to the continued development of the satellite communications industry in South Africa. ICASA’s work to implement the Satellite Licensing Framework is of critical importance as it will directly impact the structure and growth trajectory of the satellite sector. Among other things, the Satellite Licensing Framework will shape incentives to invest in the sector and enable its continued evolution and ability to introduce innovative service offerings. The Satellite Licensing Framework will also impact the cost of services in South Africa, and thus the extent to which consumers are able to benefit from the services that satellite operators will make available.

At the same time, Viasat appreciates ICASA’s recognition of and attempts to safeguard against the risks posed by certain types of satellite operations — including, in particular, risks posed by a few large NGSO systems. Among other things, these systems threaten to:

* Overconsume shared and scarce spectrum and orbital resources to the detriment of other operators and general public;
* Generate undue interference that constrains the ability of other satellite operations (including both NGSO systems and GSO networks) to innovate and compete;
* Preclude equitable access to spectrum and orbits for other NGSO systems by using up all available “look angles” through the extremely large number of satellites within their networks and particularly when employing small user terminals with wide beamwidths;
* Undermine existing satellite sector investments and the certainty needed for continued investments; and
* Unduly increase the risks associated with access to and use of space—including risks related to potential collisions and the creation of orbital debris or space junk.

Considering the above, Viasat’s submission aims to provide practical recommendations for promoting growth of the domestic satellite market for the benefit of South Africans while ensuring the safe and sustainable use of space. Moreover, Viasat is pleased to provide the ICASA with access to our thought leadership contained in Appendices 1 and 2 of this submission. Appendix 1, “Ensuring Innovation and Growth Opportunities in the New Space Age” (updated March 13, 2024)” examines a host of risks to equitable use of shared and finite spectrum and orbits occasioned by the plans of a handful of low earth orbit (LEO) mega constellations. “Appendix 2, Managing Mega Constellation Risks in LEO” investigates methods for evaluating and mitigating collision risk in LEO. Viasat is confident that these materials will serve as useful references for the further enhancement of the Satellite Licensing Framework.

Yours Sincerely

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Dr. Nigel Naidoo

Director: Regulatory and Market Access, Africa

**Responses to Questions**

**Applicable Legislation and Regulations**

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| 1. These are the policy principles from the ATU that ICASA seeks to align with. Kindly provide comment(s) on the proposed policy principles and any further recommendations listed in the above section? |
| Viasat supports alignment with the African Telecommunication Union (ATU) policy principles, as these are consistent with the ICASA’s objective of developing a streamlined and transparent Satellite Licensing Framework. That said, Viasat urges ICASA to provide additional context to guard against any misinterpretation of the ATU policy principles. For example, ATU principle 4b in the draft Satellite Licensing Framework states that national licensing processes should “follow” ITU instruments and regulatory procedures. However, it is important to recognize that this principle does not preclude South Africa (or any other nation) from adopting additional instruments and regulatory procedures. Indeed, this is specifically envisioned by the relevant ITU instruments and regulatory procedures themselves. Article 18 of the ITU Radio Regulations specifically reserves to individual Member States the authority and obligation to develop and implement licensing policies at the national level — including through the adoption of additional substantive requirements designed to safeguard South Africa’s policy interests.  Viasat also urges ICASA to make clear that the ATU policy principles are not exhaustive, including by incorporating additional policy principles within the draft Satellite Licensing Framework. In particular, the safe and sustainable use of space coupled with the equitable access to both spectrum and orbits are key determinants for South Africa's meaningful participation in the new space economy. As a result, Viasat recommends adding the following policy principles:   * Space Sustainability – to ensure long-term, safe, and reliable access to and use of space for the benefit of all South Africans; and * Equitable Access - Ensuring Equitable access to both spectrum and orbits (both NGSO and GSO). |

**Scope of the Inquiry with respect to Radio frequency bands and services**

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| 1. Do you agree with the exclusions of radio navigation satellite services, amateur satellite services, earth exploration, space research satellite services and radio astronomy services indicated above and others if applicable? If not, please explain your reasoning and propose an alternative to this proposal. |
| As an initial matter, Viasat takes no position with respect to ICASA’s provision decision to exclude radio navigation satellite services, amateur satellite services, earth exploration, space research satellite services and radio astronomy services from the scope of the draft Satellite Licensing Framework.  However, Viasat does take this opportunity to request that ICASA clarify its intended scope by proposing certain targeted changes to the table in section 5 of the draft Satellite Licensing Framework. In Viasat’s view, these changes would help to eliminate uncertainty and address certain inconsistencies. In particular, Viasat notes that:   * The terms used in Column 1 of the table (“Service Category”) are inconsistent with the standard terms used in Article 1 of the ITU Radio Regulations and should be conformed; * The L-band MSS frequency range specified in the table (under “Voice MSS and narrowband MSS”) does not include all relevant band segments. The full L-band MSS frequency range would also include the 1518 – 1525 MHz and 1668 – 1675 MHz band segments and should be adjusted accordingly; * The incorrect frequency range is specified for “2 GHz MSS.” The National Radio Frequency Plan 2021 specifies the relevant range as 1980 – 2010 MHz and 2170 – 2200 MHz. The ranges in the table should be adjusted accordingly; * The table does not include the C-band frequency range—*i.e.*, the bands 3600 – 4200 MHz and 5725 – 7075 MHz. These bands should be added to the table, in accordance with the National Radio Frequency Plan 2021; * The GSO FSS frequency range specified in the table (under “GSO & NGSO FSS”) does not include all relevant portions of the Ka-band. To address this issue, the entries in the “Ka-band” column should be replaced with 17.3 – 21.2 GHz and 27.5 – 31 GHz, in accordance with the National Radio Frequency Plan 2021; and * Similarly, the GSO and NGSO FSS entries in the “Q & V-band” column are incomplete. The complete ranges, in accordance with the National Radio Frequency Plan 2021, are 37.5 – 42.5 GHz, 42.5 – 43.5 GHz, 47.2 – 50.2 GHz and 50.4 – 51.4 GHz for GSO and NGSO FSS. In addition, 51.4 – 52.4 GHz is allocated to GSO FSS. The appropriate adjustments should be made. |

**Types of licences/authorisations (where applicable) for Satellite Communications**

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| 1. Do you agree with the proposed approach of having a separate licence/authorisation (where applicable) for each segment of the Satellite Communication value chain? Please elaborate |
| Viasat endorses ICASA’s proposal to establish separate licenses/authorisations for each segment in the satellite value chain—*i.e.*, space segment, gateway earth stations, and user terminals. Among other things, this approach will help ICASA to understand and manage the complex nature of satellite networks (*e.g.*, by appropriately recognizing that different parties may be responsible for different segments, and that a given class of user terminals may communicate with multiple satellites—and *vice versa*).  The space segment authorisation is of particular importance as it is one of the few, if not only, decisions ICASA can make to condition the provision of satellite services in the country. As a result, Viasat recommends a more rigorous space segment authorisation process for large constellation NGSO systems. This process should incorporate additional pre-requisite technical criteria and authorisation obligations to ensure the development of a vibrant and competitive satellite sector while providing for the safer and more sustainable use of space and facilitating more equitable access to scarce spectrum resources - Please refer to Question 9 for practical criteria that could be incorporated into the future space segment authorisation process.  Viasat also notes that the draft Satellite Licensing Framework does not cover the space segment authorisation process for domestic satellites—*i.e.*, satellite networks for which South Africa is the ITU filing Administration. Viasat encourages the ICASA to address this issue in the next iteration of the draft Satellite Licensing Framework. |

**Satellite Gateway Earth Stations**

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| 1. Please provide your comments on the proposals in the preceding paragraph and the duration of the Gateway Earth Station licences. |
| Viasat respectfully requests that ICASA clarify the scope of the Satellite Gateway Earth Station licence to ensure that a single license can appropriately cover deployments involving multiple antennas operating across different frequency bands (and not just operation of a single antenna using a single “specified radio frequency band”). These types of deployments are increasingly common and essential, and the requested clarification will help ensure that ICASA’s licensing processes are aligned with the practical needs of multi-antenna, multi-frequency band gateway earth station configurations.  Viasat commends ICASA for recognizing the critical link between license duration and investment certainty. However, the proposed license term of 5 years is insufficient to provide that certainty, or the stable and predictable environment sought by investors. Among other things, most gateway earth stations are expected to remain in service for well over 5 years—and the license must be guaranteed over this period in order to justify the significant investment required to deploy them. Viasat recommends establishing a licensing term of 10-15 years, aligning with practices in mature markets such as Canada, the United States of America, and the European Union.  Viasat takes this opportunity to comment on the coordination requirements discussed in section 8 of the draft Satellite Licensing Framework (which are not the subject of a specific inquiry). Notably, Section 8 states that “there shall be no coordination requirement in exclusive primary allocations.” Viasat respectfully suggests that this statement goes too far as it does not account for the fact that stations with co-primary status may need to coordinate operations with each other. Viasat submits that it would be appropriate to address this point by replacing the above statement with the text “there shall be no requirement to submit an Appendix 7 coordination contour for applications in exclusive primary spectrum”. |

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| 1. Please comment on the above-mentioned alternative proposals to levy the spectrum fees for Gateway Earth Stations and indicate your preferred option. The Authority understands that there are other spectrum fee calculation methodologies used elsewhere in the world. Please give details of the methodologies which you believe would be most suitable for South Africa. |
| Viasat supports ICASA’s proposal to reduce Gateway Earth Station spectrum fees, in line with its objective of stimulating local infrastructure investment. This measure would enable satellite operators to more effectively deploy satellite infrastructure and offer satellite communications services to South African consumers. These substantial benefits would potentially arise across all types of satellite technologies; accordingly, Viasat encourages ICASA to implement the spectrum licence fee reduction measures across all types of Gateway Earth Stations, and not solely those that form part of HTS systems.  More broadly, Viasat urges ICASA to revisit its underlying spectrum fee methodology. In Viasat’s view, the purpose of the spectrum fee should be to recoup ICASA’s administrative and spectrum management costs. Anything beyond that needlessly inflates deployment costs and may make services more expensive for consumers. A streamlined spectrum license fee structure could be achieved by appropriately scaling the fee structure in either of the models proposed by ICASA or alternatively prescribing a flat fee per Gateway Earth Station that is not linked to the spectrum utilised. |

**Satellite User Terminals**

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| 1. Kindly comment on the section above and on the proposal for blanket licensing with a fee for a set number of terminals under a new proposed licence regime to be referred to as “Satellite User Station Network Licence.” If possible, please provide a breakdown of the number of terminals with the corresponding spectrum fee values in South African Rands. |
| Viasat supports the implementation of blanket licensing, as this approach would streamline the authorization process and facilitate the large-scale deployment of satellite terminals in South Africa. However, ICASA may wish to retain the option to license terminals individually in regulatory scenarios where there is reason to believe that the operation of such terminals could pose risks that warrant closer evaluation on a terminal-specific basis prior to licensing (*e.g.,* where terminals would be deployed in the vicinity of high-priority facilities using the same or adjacent frequencies that could suffer interference as a result).  Assuming that ICASA adopts a blanket licensing approach, it should ensure that the associated fee structure does not impede the benefits of that approach. The draft Satellite Licensing Framework proposes a tiered fee structure based on the number of satellite terminals deployed. Viasat notes that the Nigeria Communications Commission (NCC), which pioneered a satellite terminal fee approach similar to that proposed in the draft Satellite Licensing Framework, has more recently transitioned to an annual fixed fee structure for satellite terminals, allowing for the unlimited deployment of both Fixed Satellite Service (FSS) and Mobile Satellite Service (MSS) terminals. Viasat submits that ICASA should consider the NCC’s experience and adopt a fixed fee structure for blanket-licensed satellite terminals. Among other things, the fixed-fee approach would reflect that all blanket-licensed terminals use the same spectrum in similar ways and *collectively* impose certain administrative and management costs on ICASA that are independent of the number of terminals licensed or operated—and should therefore be subject to a single, fixed fee (as highlighted in response to question 5, above, spectrum fees should be designed to recover relevant administrative and spectrum management costs and not more). In addition, this approach would avoid the administrative challenges associated with verifying and validating the number of domestic satellite terminals deployed. |

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| 1. Kindly comment on the appropriateness of using regulation 37 of the ICASA radio regulations (“Recognition of licences issued by other countries”) to recognize ESIM licences issued by other countries. |
| Viasat believes that it would be appropriate to use regulation 37 of the ICASA Radio Regulations to recognize ESIM licenses issued by other countries and facilitate the free circulation of foreign-registered ESIM terminals in South Africa. |

**Space Segment Authorisation**

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| 1. Part 1 - Please provide your comments and details of the best practices in other jurisdictions to fulfil the intentions of the Authority as indicated in the above section. |
| In Section 10 of the draft Satellite Licensing Framework, ICASA rightfully acknowledges that NGSO systems pose interference risks to other operators, including GSO operators. Indeed, the proliferation of large NGSO satellite systems at LEO presents a wide range of challenges for regulators and other satellite operators around the world, by:   * Generating unacceptable levels of interference through the operation of vast numbers of satellites (up to tens of thousands) covering the sky and look angles, and constraining the ability of other NGSO systems and GSO networks to deploy, innovate and compete; * Consuming an undue amount of spectrum and orbits in contravention of the ITU Constitution—and specifically Article 44, paragraph 2, which recognises that radio frequencies and orbits are limited natural resources and must be used “rationally, efficiently, and economically;” * Consuming more than their fair share of the overall interference “budget” that all NGSO systems may cause to GSO networks, thereby hindering opportunities for other parties, including national operators, to operate their own NGSO systems; and * Precluding equitable access to spectrum and orbits by other NGSO systems by using up all available “look angles” through the extremely large number of satellites within their networks and particularly when employing small user terminals with wide beamwidths.   In light of the above, African regulators have established or are considering the development of NGSO space segment authorisation processes, aimed at preserving healthy competition, ensuring sustainable development, and managing interference. ICASA has also acknowledged the potential negative impact of large NGSO systems and proposed safeguards such as mandatory compliance with Article 22 EPFD limits. However, given SpaceX’s recent FCC filings, which include (i) a proposal to degrade the EPFD limits established in Article 22 and Resolution 76 of the ITU Radio Regulations[[1]](#footnote-2), and (ii) separate filings seeking authority to operate without regard to the EPFD limits, and seeking authority to launch an additional 29,988 satellites in LEO, taking it to an unprecedented total of over 34,000 satellites,[[2]](#footnote-3) there is a crucial need for ICASA to further strengthen the regulatory measures for mitigating the risks presented by large NGSO systems. In this regard, Viasat proposes the following:  **Recommendation A – Protect GSO networks from unacceptable interference generated by NGSO systems**  The potential for disruption to GSO networks from co-frequency NGSO systems is well-known. This concern prompted the development of various ITU Radio Regulations (RR) designed to protect GSO networks from interference generated by NGSO systems. These regulations define the terms under which both GSO and NGSO systems can coexist. The principal provision for coexistence, No. 22.2 in the RR, requires NGSO systems to not cause *unacceptable* interference to GSO networks. EPFD limits apply in certain bands that, if actually met during operation, fulfil the RR No. 22.2 obligation with respect to an NGSO system. There are two types of EPFD interference limits:   * “Aggregate” EPFD limits constrain the amount of interference that all NGSO systems may generate in total, on a cumulative basis. These aggregate limits must be shared and apportioned among all NGSO systems using overlapping frequencies. * “Single-entry” EPFD limits constrain the amount of interference that one NGSO system itself may generate with respect to GSO networks. The single-entry limits were established based on an apportionment to a single NGSO system of a portion of the applicable “aggregate” EPFD limits.   **Single-Entry EPFD limits to be met by a single NGSO system**  Based on the data provided in a given ITU EPFD input filing, the ITU’s Radiocommunication Bureau (BR) does a limited assessment of the EPFD levels, based on ITU-R Recommendation S.1503[[3]](#footnote-4), that could be generated by a NGSO system with respect to *one particular combination of earth station location and GSO satellite location* (so called “worst-case geometry”). This limited assessment has little bearing on the interference that an NGSO system can be expected to produce at various locations within South Africa.  The ITU alone cannot effectively check all of the ways an NGSO system operator may try to artificially specify EPFD inputs in a way designed to “pass” the ITU’s spot checks regarding EPFD without reflecting how the NGSO system actually would operate and affect every nation. And there are multiple and well-documented examples of this already occurring. Consequently, it is imperative that the individual administrations and regulators that consider authorizing, or granting market access to, NGSO system operations take responsibility for ensuring that NGSO operators specify accurate and appropriate EPFD inputs, and otherwise comply with the relevant EPFD limits.  In a recent contribution to WP4A[[4]](#footnote-5), it was demonstrated how one NGSO operator has artificially designed a single PFD mask of one of the orbital shells, to force the current algorithm to select a specific and favourable, but non-representative, ‘worst-case geometry’ (WCG) for the entire NGSO system. Without inclusion of that particular PFD mask of the orbital shell, which has not been authorised by the filing administration for operation, S.1503-2 software produces higher EPFD with a lower number of satellites. Such practices therefore conceal the interference produced by all other PFD masks of the same NGSO system filing that actually contain higher PFD levels at locations outside the WCG, leading to large exceedances of the limits at geometries other than WCG. These EPFD limit exceedances are not identified in the examination based on S.1503-2, which may result in a flawed favourable finding for an NGSO system based on an engineered PFD mask that forces the software to evaluate interference towards GSO networks in a limited and non-representative location on Earth.As the ongoing work in ITU Working Party 4A reflects, there are significant shortcomings in the outdated Recommendation S.1503 software used by the ITU. Fortunately, alternative commercial software is available, and more is being developed that allows a more accurate assessment of the expected interference within South Africa.  **Aggregate EPFD limits to be met by *all* NGSO systems, collectively**  ITU Radio Regulations Resolution 76 (Rev. WRC-23) defines the aggregate EPFD limits that must be met by all NGSO systems, collectively, and calls for administrations to take all possible steps to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by NGSO systems does not exceed those limits. In the event that the aggregate EPFD limits are exceeded, it further calls for administrations to take all necessary measures expeditiously to reduce the aggregate EPFD levels to the limits given in Tables 1A to 1D of Res. 76.  A critical component of the aggregate EPFD assessment is to define a methodology by which multiple NGSO operators would reduce EPFD levels in case of any exceedance. Such a reduction in EPFD level must be proportional to the contribution of each NGSO system towards the aggregate EPFD. Unequitable sharing of the aggregate EPFD budget amongst NGSO systems would hinder opportunities for other parties including national NGSO systems and new entrants.  Before authorising any NGSO system to operate in South Africa, ICASA should define a methodology for how the aggregate EPFD budget can be shared amongst all NGSO systems and how the NGSO systems will reduce their EPFD levels, in case of exceedances. It is unreasonable to assume that NGSO licensees will adapt their operations if the aggregate EPFD exceedance is evaluated in South Africa at a later time, especially when there is no methodology defined upfront at the time of license grant. At the very least, it will be a long process that will cause harm to GSO operations throughout the time of the aggregate EPFD exceedances by the NGSO systems. Moreover, should interference issues arise, isolating and identifying individual EPFD contributions of every NGSO system toward the aggregate EPFD will be an impossible task.  Therefore, Viasat encourages ICASA to conduct an independent assessment of potential for interference, from a single NGSO system and all NGSO systems collectively, within South Africa’s national territory that are not covered by the limited assessments performed by the BR regarding ITU filings for the LEO system. Such assessment should require from an NGSO operator:   * A demonstration of compliance with the single-entry and aggregate equivalent power flux density (EPFD) limits prescribed in the ITU Radio Regulations Article 22 (Art. 22) and ITU Resolution 76, respectively. This should include:   + A demonstration for the LEO constellation as a whole;   + A demonstration for the specific portions of the LEO constellation proposed to serve South Africa(including the exact satellite altitudes and inclinations proposed to be used);   + A demonstration for a suitable number of representative geographic locations within South Africa and for all GSO satellite networks serving, or proposed to serve, South Africa;   + A demonstration of how the LEO system avoids interference to GSO networks created by numerous LEO earth station and satellite antenna sidelobes, and earth station antenna backlobes, particularly when phased array antennas are employed;   + A demonstration for the operation of the LEO constellation alongside the operation of all other co-frequency NGSO constellations serving South Africa; and   + Information on the ITU filing under which each of the NGSO systems seek to operate in South Africa and where the NGSO system operates under multiple filings, each application should contain EPFD input files (e.g., SRS and mask database) that represent their system as a whole and that are consistent with their ITU submission.   In order to ensure that the expected interference evaluated based on the above assessment is not exceeded during NGSO operation, ICASA should consider imposing the following conditions on current and prospective licensees:   * Each individual NGSO system shall comply with the single-entry EPFD limits in Art. 22 and all NGSO systems, collectively, shall comply with aggregate EPFD limits in Resolution 76 (Rev. WRC-23) * The 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 NGSO operator shall confirm that its deployed NGSO system is fully consistent with its ITU filings; and * The 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 South Africa, commonly known as “Nco,”   + Minimum GSO arc avoidance angle, commonly known as “alpha angle,”   + The downlink power flux density mask (PFD mask), taking into account the actual characteristics of the NGSO system as deployed, including the radiation pattern of its satellite antenna.   As mentioned above, the aggregate EPFD limits define the interference that all NGSO systems, collectively, can generate towards the GSO network and thus establish a total interference budget that must be shared by *all* NGSO systems. If, for example, one NGSO operator is allowed to operate with two NGSO systems (e.g., Generation 1 and Generation 2) and each one has a separate “share” of that aggregate budget, that NGSO operator will be able to consume a disproportionate share of the total aggregate EPFD budget, which must be shared amongst *all* NGSO operators. To avoid this result, it is critical to evaluate all the NGSO satellites operated by a given NGSO together as a single system.  The need for the conditions discussed above is reinforced by the Director of the ITU’s Radiocommunication Bureau recently released a report, which explains that the practice of splitting a NGSO satellite system into several filed systems, “may affect the effectiveness of single-entry limits contained in Art. 22 to protect geostationary systems or have an impact in the implementation of Resolution 76 (Rev.WRC-15).”[[5]](#footnote-6)  **Recommendation B - Ensure large NGSO constellations share frequencies and orbital resources effectively with other NGSOs**  Large NGSO systems with thousands of satellites, particularly when they employ small user terminals, can consume significant portions of the “look angles” toward space and LEO orbits as well, preventing use of the sharing tools that have been employed successfully for decades among certain NGSO systems. This threat to NGSO spectrum sharing occurs when large LEO constellations “blanket the sky,” causing many in-line interference events limiting and sometimes completely blocking other NGSO systems from sharing the same spectrum. A large NGSO system would rarely (if ever) experience this problem itself because it has a far greater number of satellites than smaller NGSO constellations, which provides the large NGSO system with alternative communications paths in which the same spectrum remains available for its use. The upshot is that a large NGSO system would have little incentive to avoid in-line interference events; large numbers of in-line interference events would harm smaller NGSO systems without materially impacting the large NGSO system’s operations. As a result, the large NGSO system can hinder other satellite operators, including new entrants, from accessing and using shared spectrum and orbital resources in the public interest.  To avoid this result and to ensurelargeNGSOconstellationssharefrequenciesandorbitalresourceseffectivelywithotherNGSO systems, it is critical for ICASA to require an NGSO operator to:   * Operate with only 1/n of the look angles in a given country, where n is the number of NGSO systems authorised to serve South Africa in the same frequency band (whereby NGSO systems serving a country in overlapping frequencies would divide the range of satellite azimuths as seen from a location on the Earth (i.e., “look angles”) whenever the potential for NGSO/NGSO interference exists at that location); * Coordinate in good faith and in advance with other NGSO systems so that all n look angles may be used to serve South Africa by different NGSO systems; and * Maintain an orbital tolerance of +/- 2.5 km for the apogee and perigee of each NGSO satellite, and a 0.5° tolerance for each orbital inclination the NGSO system employs, in order to ensure other NGSO systems may access the shared LEO space (or comply with such other orbital tolerance requirements as ICASA deems appropriate to ensure the ability of other satellites and systems serving its territory to operate in the same, or overlapping, orbits occupied by the NGSO system).   Viasat recommends that ICASA review the coordination terms used to provide service within South Africa to ensure that those agreements do not unduly constrain other NGSO systems and do not result in a disproportionate use of available look angles by a single NGSO operator. |

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| 1. Part 2 - Furthermore, considering the provision set out in the Astronomy Geographic Advantage (AGA) Act of 2007, and the requirements of the Radio Quiet Zone, what measures and techniques do you propose to be employed in mitigating the possible interference that may be caused by the satellites within the Astronomy radio frequency bands in South Africa? |
| Viasat supports the requirement for satellites to meet the defined ITU power-flux density limits in primary radio astronomy allocations. |

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| 1. Please provide proposals on the role the Satellite operators can play in ensuring that broadband connectivity reaches the areas of the country in terms of community networks with Satellite connectivity as a backhaul. Kindly provide a regulatory solution that can be applied by Satellite operators to address the shortcomings of terrestrial networks in providing to unserved and underserved areas of the country. This may include collaboration with government programs to reach out to those unserved and underserved areas of the country |
| Satellite operators play a significant role in closing the digital divide by providing connectivity to unserved and underserved areas, providing complementary solutions in regions already covered by terrestrial networks, and fulfilling a range of essential and critical communication requirements.  In South Africa, satellites can provide connectivity for countless applications that benefit unserved and underserved communities. Satellite services ensure adequate connectivity for schools in rural areas and provide those students with similar opportunities as students in urban areas. Moreover, satellite services connect public institutions and enable them to receive and send emergency alerts and transmit other critical safety information to improve lives in rural and remote communities. In and around remote mining sites, for example, satellites increase safety in mining communities by monitoring dangerous materials produced by the mineral extraction process. These monitoring systems alert authorities to structural weaknesses and other issues that could cause dangerous “mine tailings” to break and destroy whole communities. In deep rural farming communities, monitoring and alerting are also used for precision agriculture to predict flooding and increase crop yields, which, in turn, saves money for communities. Additionally, the efficiency and safety of local and cross-border commuting greatly improves the lives and livelihoods of citizens.  To further grow and protect these satellite services, Viasat encourages the ICASA to consider the following regulatory solutions to address the connectivity gap:  **Foster Collaboration Between Satellite Operators and Local Government Agencies:**   * Local government participation is integral to successfully closing the digital divide. Fostering collaboration between satellite operators and local government institutions will allow operators and service providers to offer targeted support to communities and swiftly address the unique issues and concerns that each community faces in relation to digital inclusion. ICASA’s regulatory solutions should include avenues through which these relationships can develop.   **Promote Stable and Interference-Free Access to Core Satellite Frequency Bands**:   * The provision of high-quality satellite services necessitates stable and interference-free access to core satellite frequency bands such as L, Ka, C, and Q/V. Viasat has consistently expressed concerns about ICASA's planned implementation of IMT in the 1427-1517 MHz frequency range due to potential interference with MSS systems operating in the L-band above 1517 MHz. As proposed in previous filings, Viasat strongly recommends that ICASA limit future IMT assignments to 1492 MHz or below. This measure would ensure that South Africans can derive maximum benefits from L-band MSS networks.   **Leverage the Universal Service and Access Fund (USAF):**   * Viasat urges ICASA to leverage the Universal Service and Access Fund (USAF) to subsidize the deployment of satellite-based community networks. Allocating these funds to projects aimed at connecting remote and rural areas will ensure that satellite operators receive the necessary financial support to expand their services to unserved and underserved communities. |

1. *See In the Matter of Revision of the Commission's Rules to Establish More Efficient Spectrum Sharing Between NGSO and GSO Satellite Systems*, Petition for Rulemaking, RM-\_\_\_\_\_\_ (Filed 9 August, 2024), [https://www.fcc.gov/ecfs/document/10809160739016/1](NULL). [↑](#footnote-ref-2)
2. *See* *Space Exploration Holdings, LLC*, Call Sign S3069, File Number SAT-MOD-20241011-00224 (Filed 11 October 2024), [https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr031b.hts?q\_set=V\_SITE\_ANTENNA\_FREQ.file\_numberC/File+Number/%3D/SATMOD2024101100224&prepare=&column=V\_SITE\_ANTENNA\_FREQ.file\_numberC/File+Number](NULL) and File Number SAT-AMD-20241017-00228 (Filed 17 October 2024), [https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr031b.hts?q\_set=V\_SITE\_ANTENNA\_FREQ.file\_numberC/File+Number/%3D/SATAMD2024101700228&prepare=&column=V\_SITE\_ANTENNA\_FREQ.file\_numberC/File+Number](NULL). [↑](#footnote-ref-3)
3. ITU-R S.1503: Functional description to be used in developing software tools for determining conformity of non-geostationary-satellite orbit fixed-satellite service systems or networks with limits contained in Article 22 of the Radio Regulations. [↑](#footnote-ref-4)
4. *See* WP4A document 4A/94 (18/04/2024) *Working document towards a preliminary draft revision of Recommendation ITU-R S.1503-4 - Underestimation of non-GSO interference arising from the use of worst-case geometry in S.1503 and necessity to supplement it with grid-based EPFD analysis*. [↑](#footnote-ref-5)
5. Director, ITU Radiocommunication Bureau, Preliminary Draft Report of the Director to WRC-23 on the Activities of the Radiocommunication Sector Experience in the Application of the Radio Regulatory Procedures and Other Related Matters, Addendum 2 to Document 4-3 (September 2023), at 28-29. Resolution 76 is discussed below. It addresses compliance with limits on the entirety of the aggregate EPFD↓ created by all NGSO systems of all operators. [↑](#footnote-ref-6)