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Subject: Consultation on the Draft National Radio Frequency Plan 2025

Dear Mr. Moshweunyane & Mr. Makgotlho,

Viasat welcomes the opportunity to provide comments on the draft National Radio Frequency Plan 2025 (NRFP 2025). The NRFP 2025 will be a crucial regulatory instrument, which will underpin the efficient and effective management of the scarce spectrum resource for the benefit of South Africans. Viasat appreciates the opportunity to work with ICASA to ensure that the NRFP 2025 achieves this objective. As ICASA notes in Section 2.1 of the draft NRFP 2025, the Electronic Communications Act provides that "[w]hen updating and amending [the NRFP] due regard must be given to the current and future usage of spectrum." Considering this legislative mandate, Viasat's submission:

- Highlights critical and ongoing uses of L band mobile-satellite service (MSS) spectrum and suggests targeted changes to the NRFP 2025 that ensure interference-free operation within the Mobile-Satellite Service (MSS) frequency band 1518–1559 MHz.

- Provides practical insights into how the operations of large non-geostationary satellite orbit (NGSO) constellations could negatively impact the spectrum environment in which geostationary (GSO) and NGSO networks must coexist. To address these risks, Viasat proposes the introduction of a new South African national footnote reaffirming the country's commitment to enforcing compliance with the Article 22 EPFD framework - an essential safeguard for protecting GSO networks from harmful NGSO interference.

I look forward to continued engagement in support of South Africa's spectrum management objectives.

Yours sincerely,

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Dr. Nigel Naidoo

Director: Regulatory and Market Access, Africa

1. Ensuring L Band Mobile Satellite Service Protection & Innovation

As noted above, the Electronic Communications Act provides that "[w]hen updating and amending [the NRFP] due regard must be given to the current and future usage of spectrum." Toward that end, Viasat takes this opportunity to highlight the many ways in which the L band continues to be used to support the provision of critical MSS services. Viasat also suggests targeted changes to the draft NRFP 2025 to give "due regard" to the current and future uses of the L band for MSS. In particular, Viasat respectfully urges ICASA to ensure that the final NRFP maintains the IMT identification cap at 1492 MHz to ensure the interference-free operation of L band MSS services operating above 1518 MHz.

1.1 The Critical Role of L Band MSS Services

The 1518–1559 MHz band is globally allocated for the MSS. Among other things, this band supports critical applications such as the Global Maritime Distress and Safety System (GMDSS), the Global Aeronautical Distress and Safety System (GADSS), environmental monitoring, disaster response coordination, and secure governmental communications. These services rely on the priority and pre-emptive capabilities that are ensured by interference-free operation of mobile satellite networks operating in the L band.

Over the past four decades, the dependence on MSS networks operating in the L band has only deepened as global demand for resilient, highly reliable communications has increased. Natural disasters, public health emergencies, and rising cybersecurity threats have underscored the vital role of mobile satellite networks in maintaining communication continuity when terrestrial networks are unavailable or overwhelmed.

South Africa, with its expansive maritime jurisdiction, critical aviation corridors, and vulnerability to natural hazards, is particularly dependent on the uninterrupted functioning of MSS services throughout and around the country. MSS operating in the L band also plays a vital role in supporting South Africa's GDP growth, job creation, and overall national competitiveness and security. A few examples should suffice to illustrate these points:

- **Shipping and Maritime Trade:** South Africa's economy is heavily reliant on its ports as conduits for international trade. The ports of Durban, Cape Town, and Port Elizabeth are among the busiest in Africa, handling significant volumes of commodities, manufactured goods, and energy resources. Reliable and secure maritime communication via GMDSS-compliant systems, facilitated through L band MSS, is mandatory for international shipping operations. Disruption to MSS would directly

impact port operations, logistics chains, customs processing, security awareness, and South Africa's attractiveness as a trade hub.

- **Aviation and Tourism:** The aviation sector, including commercial airlines, cargo carriers, general aviation, and government operators, depends on secure, real-time satellite communication for navigation, distress signalling, and operational coordination. As a regional aviation gateway and a country heavily reliant on tourism revenues, South Africa's reputation for air safety and operational efficiency is crucial.

- **Mining, Agriculture, and Industrial IoT:** South Africa's remote mining operations and large-scale agricultural sectors increasingly rely on satellite-enabled IoT solutions for asset tracking, environmental monitoring, supply chain management, and operational safety. MSS provides the only viable connectivity for these applications in regions where terrestrial networks are absent or unreliable. Threatening MSS operational reliability will stifle digital transformation initiatives in these critical industries, stalling productivity gains and innovation.

- **Emergency Services and Disaster Recovery:** MSS also supports emergency management agencies during national disasters — whether wildfires, floods, or public health crises — by providing real-time, fail-safe communications when terrestrial networks are compromised. Tampering with this layer of resilience risks increasing response times, escalating human and economic losses, and damaging public confidence in government emergency preparedness.

- **Scientific Research and Environmental Monitoring:** South Africa's commitments to climate monitoring, marine science, and environmental sustainability depend on uninterrupted data streams from satellites operating in protected bands. These count on MSS reliability for their data collection activities.

- **Remote Connectivity:** In rural, remote, and underserved areas where terrestrial networks either do not exist or are unreliable, MSS provides vital communications lifelines for communities, government services, and industry sectors such as mining, agriculture, and tourism. These sectors, which form critical pillars of South Africa's economy, increasingly depend on MSS connectivity for remote monitoring, logistics, supply chain management, and environmental stewardship.

- **Future Innovation and Strategic Use of the L band:** Advances in handset technology, globally harmonized standards, and technology convergence are enabling Direct-to-Device (D2D) communications between satellite and conventional terrestrial

mobile handsets and other end-user devices. Viasat's L band satellite SOS services for Google Pixel 9 devices (3GPP Rel. 17, Band 255) have been available since August 2024[1]. Viasat has already conducted real-world demonstrations and trials of its D2D devices around the world, including in the automotive sector, targeting applications such as autonomous vehicles, emergency calling, and collision avoidance. As the D2D ecosystem matures and consumer devices increasingly incorporate the capabilities enabled by 3GPP Release 17 and subsequent releases, Viasat expects the use cases for its D2D service offerings and technologies to broaden considerably. Viasat anticipates that a sizeable portion of this D2D demand will be for land mobile-based, that is, supplementing and enhancing the capabilities of terrestrial MNO systems.

Therefore, any proposed changes to the spectrum environment surrounding the 1518–1559 MHz band must be approached with extreme caution, to ensure continued prioritising and safeguarding critical lifesaving MSS operations. If ICASA considers allowing new services in adjacent bands, it would require detailed studies and development of a significant guard band and other technical mitigation measures to minimize the likely operational degradation or possible failure of MSS systems.

1.2 Implications for the expansion of IMT Beyond 1492 MHz

1.2.1 MSS Service Degradation

Technical studies conducted by global regulatory bodies, including the ITU-R Reports and Recommendations on MSS and IMT coexistence (Report M.2529 and Recommendation M.2159, respectively), conclusively demonstrate that introducing IMT services into the 1492–1518 MHz frequency range would result in significant harmful interference to MSS operations within 1518–1559 MHz.

Two primary terrestrial IMT interference mechanisms are of critical concern:

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[1] *See* Viasat Press Releases, *Direct-to-device satellite services successfully trialed for first time in India by Viasat and BSNL,* (New Delhi, Oct. 14, 2024), https://investors.viasat.com/news-releases/news-release-details/direct-device-satellite-services-successfully-trialed-first-time; *Direct-to-Device Satellite Message Demonstrating for First Time in the Kingdom of Saudi Arbia* (Carlsbad, Nov. 27, 2024), https://investors.viasat.com/news-releases/news-release-details/direct-device-satellite-messaging-demonstrated-first-time; *Message Received: Viasat Continues Direct-to-Device Showcase with First Demonstration in Unted Arab Emirates* (Carlsbad, Dec. 11, 2024), https://investors.viasat.com/news-releases/news-release-details/message-received-viasat-continues-direct-device-showcase-first; *Viasat and partners deliver first-of its-kind direct-to-device demonstration in South America* (Carlsbad, Mar. 6, 2025), https://investors.viasat.com/news-releases/news-release-details/viasat-and-partners-deliver-first-its-kind-direct-device.

- **Blocking Interference**: IMT terrestrial base stations, operating at high power levels emit high powered signals that can completely block MSS devices from receiving the signals transmitted from satellites in geostationary orbit (approximately 36,000 kilometres away). This intense MSS device blocking by IMT base stations leads to complete service failure in the affected area.

- **Out-of-Band Emissions (OOBE) Interference:** Even when IMT base-station operations are moved further away in the band, the physical reality of radio transmission results in signal energy spilling over into adjacent frequency bands. These out-of-band IMT emissions interfere with MSS operations by raising the MSS user terminal noise floor, disrupting reception quality, increasing error rates, and rendering critical satellite services unreliable, especially at the very low signal-to-noise margins that MSS systems must operate under.

The consequences of these IMT terrestrial interference mechanisms are particularly severe in environments where mission critical MSS availability is required.

1.2.2 Economic and Developmental Implications

The decision regarding the potential deployment of terrestrial IMT systems in the frequency range 1492–1518 MHz frequency band must be evaluated considering the broader implications for South Africa's economy, national security, and developmental trajectory. The continued protection of the L band for MSS is essential for safeguarding key sectors of the economy and ensuring the sustainability of South Africa's digital future. In this regard, disruption to MSS operations could:

- **Undermining investment confidence** in satellite infrastructure and services, discouraging both domestic and international stakeholders from engaging in South Africa's space and communications sectors**.**

- **Raising operational costs** for critical industries such as agriculture, logistics, and energy, which rely on dependable satellite connectivity for precision farming, fleet management, and remote monitoring.

- **Delaying progress toward digital inclusion**, as MSS plays a pivotal role in connecting schools, clinics, and underserved communities where terrestrial networks are unavailable or unreliable.

- **Increasing vulnerability during emergencies**, as MSS provides resilient, always-on communication channels that are essential when terrestrial networks are compromised by natural disasters or national crises.

Hence, protecting the L band for MSS is not only a technical or regulatory issue - it is a strategic imperative for ensuring economic resilience, inclusive development, and national sovereignty.

1.2.3 International and Regional Safety and Security Risks

Beyond telecommunications law, South Africa's obligations to the International Civil Aviation Organization (ICAO) (https://www.icao.int/Pages/default.aspx) and the International Maritime Organization (IMO) (https://www.imo.org/) further reinforce the necessity of preserving reliable, interference-free MSS operations. ICAO standards require continuous, real-time communication between aircraft and air traffic controllers, particularly in oceanic and remote airspace areas where terrestrial infrastructure is limited or non-existent, and for critical services like the Global Aviation Distress Safety System (GADSS).

Similarly, IMO regulations mandate the reliability of GMDSS distress communications for all international voyages. In particular, South Africa must fulfil its Search and Rescue (SAR) obligations, covering one of the largest navigation areas, extending deep into the Southern Atlantic and Indian Oceans.

1.3 Notable Regional Developments

In addition to international obligations, regional regulatory trends also provide important context for South Africa's decision-making. Although the band 1427-1518 MHz was identified for IMT in 2015 on a global scale, there has been very little IMT deployment to date. We are not aware of any IMT deployment in this band in Africa, while during this period there has been deployment of 4G and 5G technologies in several other bands. Moreover, it should be noted that regulators in other leading markets, including Germany, the Netherlands, Italy, and Malta have opted to cap IMT operations at 1492 MHz, prioritising the protection of MSS operations over the commercial expansion of terrestrial mobile networks in this sensitive frequency range. South Africa now faces a similar choice.

1.4 Recommendations

The consideration of technical evidence, international precedent, and potential risks leads to a clear and compelling conclusion: the protection of the L band must be a national

priority. Accordingly, Viasat respectfully urges ICASA to consider limiting the IMT identification to 1492 MHz to guarantee the protection of L band MSS systems operating from 1518 MHz. This would entail the following amendments to the South African allocations and footnotes reflected in column 2 of the NRFP 2025:

1427 – 1429 MHz

MOBILE except aeronautical mobile ~~5.341A~~ NFx

1429 – 1452 MHz

MOBILE except aeronautical mobile ~~5.341A~~ NFy

1492 – 1518 MHz

MOBILE except aeronautical mobile ~~5.341A~~

NFx - The frequency band 1 427-1 452 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of this frequency band by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No. 9.21 with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. 5.342. (WRC-15)

NFy – The use of the band 1492 –1518 MHz by IMT is not authorized in South Africa

Alternatively, the Authority could consider amending the IMT 1500 Radio Frequency Spectrum Assignment Plan to introduce an appropriate guard band between IMT and Mobile-Satellite Service (MSS) networks, along with implementing interference mitigation measures in line with ITU-R Recommendation M.2159.

2. Ensuring Fair Use of Shared Space Resources

As mentioned previously, a core tenet of the NRFP 2025 is to reflect both current and future uses of spectrum. In this context, Viasat offers practical insights into how the operations of large non-geostationary satellite orbit (NGSO) constellations could negatively impact the spectrum environment in which geostationary (GSO) and all NGSO systems must coexist. To address these risks, Viasat proposes the introduction of a new national footnote reaffirming the country's commitment to enforcing compliance with the existing Article 22 EPFD framework[2] - an essential safeguard for protecting GSO networks from unacceptable NGSO interference.

2.1 The Need to Uphold Article 22

The proliferation of large NGSO satellite systems in low Earth orbit (LEO) presents a growing threat to the safe, reliable, and equitable use of space, including for spectrum and the associated satellite orbits. Large constellations, characterized by thousands of satellites, dense beam patterns, very small user terminals, and intensive frequency reuse in high-demand regions—significantly constrain the ability of smaller or emerging NGSO systems to access the shared spectrum. This not only undermines competition, innovation, and sustainable growth in the space sector, but also raises serious concerns about national sovereignty and security, even for countries with advanced space capabilities.

Recognizing these challenges, the International Telecommunication Union (ITU) has acknowledged the need for stronger safeguards. Resolution 74, adopted at the 2023 Radiocommunication Assembly (RA-23)[3], explicitly calls for continued technical work on interference assessment and mitigation among NGSO systems. The resolution emphasizes the importance of:

> "*...the prevention of harmful interference, and ensuring the rational, equitable, efficient and economical use of the radio-frequency spectrum and associated orbit resources, with a*

[2] ITU Radio Regulations, Article 22.2 states as follows: "Non-geostationary-satellite systems shall not cause **unacceptable interference** to and, unless otherwise specified in these Regulations, shall not claim protection from geostationary-satellite networks in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations."

[3] ITU Radio Assembly, Resolution 74 (RA Dubai, 2023), *Activities related to sustainable use of radio-frequency spectrum and associated satellite-orbit resources used by space services*, https://www.itu.int/dms_pub/itu-r/opb/res/R-RES-R.74-2023-PDF-E.pdf.

focus on non-GSO systems... taking into account the special needs of the developing countries and the geographical situation of particular countries."

The rapid expansion of large NGSO satellite systems in LEO also increases the risk of interference to GSO networks - degrading services that are vital for communications, navigation, Earth observation, science, defence and national security, and stifling the deployment of innovative GSO solutions utilising small and phased array terminals. To manage this risk, the ITU's Article 22 of the Radio Regulations and Resolution 76 (WRC-23)[4] establish single-entry and aggregate equivalent power flux-density (EPFD) limits, respectively. These limits are designed to prevent unacceptable interference from NGSO systems into GSO networks, ensuring that all satellite systems especially those operated by smaller or emerging space nations can coexist and innovate.

At the World Radiocommunication Conference 2023 (WRC-23), more than 60 countries, including many African nations, reaffirmed the importance of ensuring (i) that GSO networks do not receive unacceptable interference from NGSO systems and (ii) that there is continued innovation and growth in the industry for new GSO services that would compete effectively with current and future NGSO systems. They did so by rejecting a proposed future agenda item to degrade the Article 22 EPFD limits5, emphasizing that:

- The RR Article 22 EPFD framework and limits is fundamental to ensuring the continued operation of GSO satellite networks, including the ability to deploy the same types of small and phased array terminal antennas that NGSO operators can deploy today; and
- Changes to the existing EPFD framework can reduce GSO network capacity, disrupt real-time, mission-critical GSO services GSO service and even preclude future performance enhancements of GSO networks.

The Conference also decided to update the Radio Regulations to call for regular formal consultation meetings between administrations to assess and ensure compliance of NGSO systems with the aggregate EPFD limits in Resolution 76 for protection of GSO networks. To

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4 ITU Radio Regulations, Resolution 76 (WRC-23), *Protection of geostationary fixed-satellite service and geostationary broadcasting-satellite service networks from the maximum aggregate equivalent power flux-density produced by multiple non-geostationary fixed-satellite service systems in frequency bands where equivalent power flux-density limits have been adopted*, Final Acts WRC-23, p. 291.

5 *See* Minutes of the 11th Plenary Sessions (Wednesday, 13 December, 2023 at 15;45, p. 5) which state as follows: "WRC-23 invites ITU-R to conduct technical studies on the EPFD limits **in Article 22, including the EPFD** limits referred to in No. 22.5K, **in order to ensure the continued protection of GSO FSS and BSS networks**, and to **inform** WRC-27 of the results of the studies, **without any regulatory consequences**. This work should not be submitted under Agenda Item 9.1."

facilitate the consultation meetings, the ITU-R will continue its urgent work to finalize the methodologies to calculate aggregate EPFD and reduce EPFD levels among multiple NGSO systems if the limits are exceeded.

As the Authority knows, despite this clear international consensus and the decision of the Conference not to modify the ITU's EPFD framework, two mega-constellation operators are still trying to increase the level of unacceptable interference they generate towards GSO networks by as much as 100x, change or replace the EPFD framework, and foreclose the ability of others to compete with them. As South Africa experienced at the latest ITU-R Working Party 4A, its contribution to prioritize the work of Working Party 4A was challenged by a few administrations that blindly support the NGSO mega-constellations and opposed any efforts to respect the scope of the WRC-23 Minutes that provide the guidance on Article 22 for the Working Party[6]. Instead, they want to treat the Minutes that are the outcome of WRC-23 as a psudeo-WRC-27 agenda item and use it to propose regulatory changes to Article 22 and degrade the NGSO EPFD limits at WRC-27. Viasat appreciates South Africa's contribution to Working Party 4A ensuring the WRC-23 outcome is respected during this study cycle and through WRC-27.

Therefore, without firm regulatory safeguards, sovereign nations may lose the ability to ensure fair access to scarce spectrum and associated orbital resources for their own national or competitive satellite systems. In this context, it is imperative that ICASA reaffirm its commitment to the long-standing Article 22 framework, which remains the only enforceable mechanism for limiting NGSO unacceptable interference into GSO networks.

2.2 Recommendations

In light of the above, Viasat respectfully recommends that ICASA introduce new national footnote in column 2 of the NRFP 2025. This footnote should explicitly state that the existing EPFD limits established under Article 22 of the ITU Radio Regulations apply to all relevant frequency bands used by NGSO systems. Such a measure would:

- Provide regulatory clarity within the national framework;
- Reinforce South Africa's leadership in promoting equitable access to space resources; and
- Secure the country's interests in future international discussions.

[6] ITU-R Working Party 4A (Doc. 4A/409), *Organization of work related to non-GSO FSS systems*, submitted by South Africa (23 April 2025), https://www.itu.int/md/R23-WP4A-C-0409/en.