August 27, 2021

Independent Communications Authority of South Africa
350 Witch-Hazel Avenue, Eco Point Office Park
Eco Park, Centurion
South Africa
Private Bag X10,
Highveld Park 0169
Centurion, Pretoria

Submitted electronically: Mr Manyaapelo Richard Makgotlho
e-mail: rmakgotlho@icasa.org.za

Re: Draft National Radio Frequency Plan 2021 for Public Consultation

Viasat is grateful for the opportunity to submit comments to the Independent Communications Authority of South Africa (ICASA) on the Draft National Radio Frequency Plan 2021 for Public Consultation[1]. Viasat submits these comments in support of ICASA's proposals for modifying the National Radio Frequency Plan (NRFP) 2021 in the 17.7-19.7 GHz (18 GHz) and 27.5-29.5 GHz (28 GHz) bands by adding Footnote 5.517A[2] and Resolution 169 from the International Telecommunications Union's (ITU) Radio Regulations. Adding these provisions, to include earth stations in motion (ESIM) communicating with geostationary satellite (GSO) networks as an application of the Fixed Satellite Service (FSS) in the Republic of South Africa is consistent with the international action taken at the ITU's World Radio Conference in 2019 (WRC-19) and the implementation of those provisions in countries around the world. Viasat also supports ICASA's proposal to identify the 24.25-27.5 GHz (26 GHz) band for International

1 *See Government Gazette Staatskoerant*, Republic of South Africa, Vol. 673, No. 403, Gazette No. 44803, Page No. 3 (9 July 2021), General Notices, Independent Communications Authority of South Africa, Draft National Radio Frequency Plan 2021 for Public Consultation, https://www.icasa.org.za/legislation-and-regulations/radio-frequency-spectrum-plans/draft-radio-frequency-spectrum-plans.

2 ITU Radio Regulations, Footnote 5.517A states: "The operation of earth stations in motion communicating with geostationary fixed-satellite service space stations within the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) shall be subject to the application of Resolution 169 (WRC-19)."

Mobile Telecommunications (IMT), also known as terrestrial 5G, with the adoption of Footnote 5.532AB[3] as well as other millimetre wave bands identified for terrestrial IMT/5G by WRC-19[4].

Viasat, Inc. is a leading global provider of communications solutions and broadband services across a wide variety of technologies, both satellite and terrestrial. We design and build every component of our system – user terminals, satellite payloads and ground stations – to meet the growing market demand for reliable, effective, and affordable high-speed broadband connectivity.

Viasat is committed to powering hundreds of millions of connections around the globe, including in South Africa, on land, in the air, and at sea. Our next generation Ka-band very high-throughput satellite constellation – ViaSat-3 – will enable the provision of cost-effective bandwidth to power South Africa's key economic verticals, including the public sector, healthcare, agriculture, and education, connect the unserved and underserved, and accelerate digital transformation across South Africa.

Viasat's satellite technology uses the 17.7-21.2 GHz (downlink) and 27.5-31 GHz (uplink) portions of the Ka band to offer a wide range of satellite broadband services around the world to fixed locations in urban, sub-urban, and rural locations, and to ubiquitous mobile users via ESIM. ESIM provide broadband for gate-to-gate aeronautical and pier-to-pier maritime services as well as for land-based mobile users, such as emergency response vehicles, and buses and trains that require advanced broadband solutions within South Africa. Viasat's technology is also vital to the Defence sector, with applications to provide "anywhere, anytime" assured communications, instant access to intelligence, surveillance, and reconnaissance (ISR) video, maps, voice, and data.

Viasat has recently incorporated its local entity, Viasat South Africa PTY Ltd, in South Africa to expand its services in the market and to seek licenses to serve users in South Africa[5]. Viasat will soon commence service over the ViaSat-3 Ka Band satellite in South Africa which will have unprecedented levels of capacity and cost-effectiveness, further advancing the country's digital transformation.

---

[3] ITU Radio Regulations Footnote 5.532AB states: "The frequency band 24.25-27.5 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution 242 (WRC-19) applies."

[4] *See* ITU Press Release, *WRC-19 identifies additional frequency bands for 5G*, (Nov. 22, 2020) (those bands include the following: 24.25-27.5 GHz, 37-43.5 GHz, 45.5-47 GHz, 47.2-48.2 and 66-71 GHz), https://news.itu.int/wrc-19-agrees-to-identify-new-frequency-bands-for-5g/.

[5] Viasat South Africa Proprietary Limited's office is located at Central Office Park No 4, 257 Jean Avenue, Centurion, Gauteng, 0157.

The 18 and 28 GHz bands are critical for providing satellite broadband services in South Africa. Alignment of the South African NRFP with the ITU's Radio Regulations satellite broadband allocations for the 18 and 28 GHz bands will ensure consistent and safe authorization of satellite broadband services throughout South Africa in the Ka bands. We note that both WRC-15 and WRC-19 determined that ESIM fulfils critical global mobile broadband goals. In particular, WRC-15 opened the 19.7-20.2 GHz and 29.5-30 GHz parts of the Ka band for ESIM and decided that further expansion of GSO ESIM in the 18 GHz and 28 GHz bands would be considered at WRC-19 to extend mobile connectivity.

The adoption of Footnote 5.517A at WRC-19 made more Ka-band FSS spectrum available to ESIM and enabled ubiquitous ESIM connectivity throughout the Ka band for aero, maritime, and land-based operations. Importantly, WRC-15 and WRC-19 both determined that ESIM in these parts of the Ka band are an application of the FSS[6]. WRC-19 extended the decision of WRC-15 and opened the entire 27.5-30 GHz and 17.7-20.2 GHz bands to GSO ESIM, consistent with applicable provisions of the Radio Regulations.

On the national level, Viasat points out primary allocation of the FSS throughout the Ka band (17.7-20.2/27.5-30 GHz) in the NRFP. As ESIM are a part of the FSS allocation throughout the Ka band, they are entitled to primary status with respect to secondary services and co-primary status with respect to other co-primary services. For the benefit of implementation of GSO ESIM in South Africa, we highlight the following provisions of Res. 169 (WRC-19), which explain why that Resolution does *not* limit ESIM operations in the 27.5-29.5 GHz band segment within an Administration's borders, but rather provides guidance for the rare cross-border case where, *in a neighboring country*, terrestrial services may be *allocated and operating* in the very same frequencies as a GSO ESIM:

- Resolves 1.2.4 provides: "the provisions in this Resolution, including Annex 3, set the conditions for the purpose of protecting terrestrial services from unacceptable interference from aeronautical and maritime ESIMs **in neighbouring countries** in the frequency band 27.5-29.5 GHz";

- Paragraph 1 of Annex 3 provides: "The parts below contain provisions to ensure that maritime and aeronautical ESIMs do not cause unacceptable interference **in neighbouring countries** to terrestrial service operations when ESIMs operate **in frequencies overlapping** with those used by terrestrial

[6] *See* Resolution 156 (WRC-15, Geneva) "Use of the frequency bands 19.7-20.2 GHz and 29.5-30 GHz by earth stations in motion communicating with geostationary space stations in the fixed-satellite service" considering e), resolves 1.1; Resolution 169 (WRC-19, Sharm el-Sheikh) "Use of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz by earth stations in motion communicating with geostationary space stations in the fixed-satellite service" resolves 6; and footnote 5.517A of the Radio Regulations as adopted by WRC-19.

services at any time to which the frequency band 27.5-29.5 GHz is **allocated and operating** in accordance with the Radio Regulations (see also resolves 3 of this Resolution)";

- Part II of Annex 3 provides power flux density (PFD) limits for the 27.5-29.5 GHz band segment when an aeronautical ESIM is operating "**within line-of-sight** of the territory of an administration";

- The *further resolves* provides that an administration **may authorize ESIMs within its own territory without reference to the power flux density levels contained Res. 169** where doing so does not affect other administrations.

In sum, it would be possible for ICASA to permit ESIM to operate without limitation in both of those band segments, and to stipulate only that GSO ESIM licensees adhere to the provisions of Footnote 5.517A of the Radio Regulations and Resolution 169 of WRC-19 at the borders of the neighboring countries of Namibia, Botswana, Zimbabwe, Mozambique, Eswatini and Lesotho, if those countries have allocated and operational terrestrial services in overlapping frequencies with GSO ESIM. Viasat respectfully requests that ICASA adopt a framework for GSO ESIM that classifies it as part of the existing FSS allocation, as outlined above, and permit ubiquitous gate-to-gate, pier-to-pier, and ubiquitous land-mobile ESIM service and the wide deployment of GSO ESIM to enable the widest possible broadband connectivity within South Africa.

Viasat also supports ICASA's proposal in the consultation that the 26 GHz band is the right band for accommodating any requirements for millimetre wave spectrum for terrestrial IMT/5G. To date, there has been little usage of the 26 GHz band internationally due to limited demand for terrestrial use of millimetre wave given the uncertainty of the business case for this band. Thus, Viasat recommends that ICASA adopt an approach that accommodates any future demand for terrestrial IMT/5G millimetre wave services in the 26 GHz band and other bands identified for terrestrial IMT/5G, while also appropriately protecting existing services, including satellite-powered broadband services operating in the adjacent 28 GHz band.

The ITU WRC-19 designated over 17 gigahertz of spectrum for terrestrial IMT/5G in the millimetre wave bands, including the 26 GHz band[7]. Viasat urges ICASA to take the vast amount of spectrum available

[7] *See* ITU Press Release, *WRC-19 identifies additional frequency bands for 5G*, (22 Nov. 2020) (those bands include the following: 24.25-27.5 GHz, 37-43.5 GHz, 45.5-47 GHz, 47.2-48.2 and 66-71 GHz), https://news.itu.int/wrc-19-agrees-to-identify-new-frequency-bands-for-5g/.

for terrestrial IMT/5G in the millimetre wave bands, identified by WRC-19, and the additional low-band and mid-band spectrum being made available in countries around the world for terrestrial IMT/5G, into account as part of its overall review of spectrum for terrestrial IMT/5G services.

Viasat has supported the study and the development of reasonable operating parameters for terrestrial IMT/5G in the 26 GHz band through the ITU WRC-19 process. To this end, Viasat urges ICASA to conform domestic deployment of terrestrial IMT/5G in the 26 GHz band to the operating parameters decided in Resolution 242 (WRC-19) as well as additional out-of-band domain and spurious domain emission limits described below. Viasat emphasizes the importance of the portion of Resolution 242 (WRC-19) that requires IMT/5G base stations within the 26 GHz band with higher power operations (e.i.r.p per beam exceeding 30 dB (W/200 MHz)) to not point their antenna beams upward at the geostationary satellite orbit and maintain a minimum separation angle of ≥± 7.5 degrees.

Viasat, as with many satellite operators, uses the 28 GHz band for fixed and mobile satellite-powered broadband, including ubiquitous GSO ESIM services. As such, we are concerned about potential out-of-band emissions from 26 GHz band terrestrial IMT/5G systems into the 28 GHz band. Any increases in power by terrestrial IMT/5G systems in the 26 GHz band, beyond those specified in Resolution 242 (WRC-19), would increase out-of-band emissions in the 28 GHz band. The potential impact of increased out-of-band emissions from the 26 GHz band could adversely affect the interference environment in the 28 GHz band by impacting the ability of satellites receiving signals from earth stations. Therefore, we respectfully request that ICASA require appropriate out-of-band limitations on terrestrial IMT/5G operations to protect satellite services in the 28 GHz band. At a minimum, terrestrial IMT/5G stations should be required to comply with out-of-band domain and spurious domain emission limits in the frequencies above 27.5 GHz as described in Recommendations ITU-R SM. 1541-6 and ITU-R SM. 239. In the case of ITU-R SM.329, the category B limits should apply. Viasat also requests that ICASA ensure that the *aggregate level* of terrestrial out-of-band emissions from the 26 GHz band into the adjacent 28 GHz band does not cause interference to satellite receivers in the 28 GHz band.

In conclusion, Viasat supports ICASA on its efforts to facilitate the deployment of satellite broadband, including ESIM in the 18 and 28 GHz bands and identification of spectrum for terrestrial IMT/5G in the 26 GHz band, and other bands identified for terrestrial IMT/5G by WRC-19, while keeping critical satellite spectrum available for companies like Viasat to make investments in serving the South African market. Viasat believes that low- and mid-band spectrum is more suitable for terrestrial IMT/5G deployment, noting that there is uncertainty regarding deployment costs and viability of commercial use cases for millimetre wave bands. We emphasize that any terrestrial IMT/5G deployments in the 26 GHz

millimetre wave band should be in conformity with the ITU's Radio Regulations, noting the limitations on terrestrial IMT/5G under Resolution 242 to protect existing services. This will ensure consistent and safe deployment of satellite broadband services in the 18 and 28 GHz band and terrestrial IMT/5G in the 26 GHz and other bands identified by the ITU for that service.

Viasat appreciates ICASA's consideration of the information above. We remain at ready to answer any further questions or provide further details as requested.

Respectfully Submitted,

Christopher J. Murphy

Associate General Counsel, Regulatory & Spectrum Policy
Viasat