TELEMEDIA RESPONSE

TO NOTICE 6066 PUBLISHED IN GOVERNMENT GAZETTE NO. 52415 OF 28 MARCH 2025

ISSUED BY THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA:

DRAFT REGULATIONS ON DYNAMIC SPECTRUM ACCESS AND OPPORTUNISTIC SPECTRUM ACCESS IN THE INNOVATION SPECTRUM 3800 MHZ – 4200 MHZ AND 5925 – 6425 MHZ

1. Executive Summary

1.1. Telemedia has taken note of Notice 6066 issued by the Authority relating to the Draft Regulations on Dynamic Spectrum Access and Opportunistic Spectrum Access in the frequency bands 3800 MHz – 4200 MHz and 5925 MHz and 6425 MHz bands ("Draft Regulations").

1.2. Telemedia is the owner and operator of one of the largest privately owned teleports in Africa and has been in existence for more than 4 decades. Telemedia has been and continues to provide FSS based services to broadcasters, both local and international, on a fixed and nomadic basis for both permanent and temporary links.

1.3. In addition, Telemedia are one of the leading providers of occasional use satellite services from temporary locations across the country for services such as news, sport, social and political events.

1.4. Telemedia have made and continue to invest in substantial capital investment programs for the provision of satellite services to numerous local and international clients.

1.5. The Telemedia Teleport located in Rivonia, Gauteng, and its Disaster recovery facility located in Randburg, Gauteng have access to over 20 different satellites with various orbital locations, which operate in many cases in the C-Band frequency range both for transmission services as well as reception services

1.6. The use of the C-Band for broadcast signal distribution is a well-established and very reliable service as typically C Band satellite footprints provide very wide coverage of large geographical areas typically the size of continents.

1.7. The other major advantage that C-Band services have in the broadcast industry (as compared to the use of Ku Band) is that they are largely unaffected by rainfall and inclement weather. As opposed to direct to home satellite services which operate in much high frequency bands such as Ku Band or Ka Band, C Band services are well positioned for satellite distribution services because they have significantly large

coverage footprints and are resilient to the impact of weather. The downside of C Band Satellite links is that they do require larger sized receiver dishes.

1.8. Telemedia have reviewed the Draft Regulations with deep concern and is strongly opposed to the Draft Regulations in its current form.

1.9. The Draft Regulations is fundamentally flawed in its analysis, which appears, at least on the face of it, to have considered very limited test sites and focused its interference analysis on the frequency bands 5800 MHz – 6400 MHz, without carefully taking into account the impact that these Draft Regulations may have on the 3800 MHz to 4200 MHz band where the bulk of broadcast reception services would be found.

1.10. Furthermore it is our understanding that the Draft Regulations attempt to delegate the powers and responsibilities of the Authority to a new independent third party described as a USSP. If this is the case, to the best of our knowledge, Telemedia is not aware of any amendments to the ICASA Act that would enable the delegation of such powers to an independent third party. The ICASA Council is only empowered to delegate any power, function or duty of the Authority to any councillor, committee of the Council or its chief executive officer.

1.11. Telemedia has noted, with disappointment, that the level of industry wide participation in the simulation tests completely ignore existing incumbent licensees and operators such as Telemedia and others, all of whom are likely to be impacted by these Draft Regulations. Telemedia is of the view that insufficient industry participation in this process would render these Draft Regulations procedurally questionable at best.

1.12. Telemedia strongly requests that the Authority set aside these Draft Regulations and revisit the matter with more meaningful and substantive stakeholder participation,

in particular, simulation testing must be conducted with the involvement of all major FSS users in the country.

2. Introduction

2.1. Telemedia appreciates the opportunity to be able to comment on the Draft Regulations.

2.2. Telemedia reserves its right to further augment its written submission.

2.3. Telemedia requests an opportunity to augment its written submission with oral representations in the event that the Authority decides to holds public hearings on the Draft Regulations

2.4. Telemedia respectfully submits that the use of satellite technology for broadcast distribution and contribution as well as data connectivity in the C-band frequency range, the subject of the Draft Regulations, has been part of our business for more than two decades.

2.5. The subject of the Draft Regulations and the future of C-band frequencies will have a direct impact on Telemedia and the broader Fixed Satellite Services industry.

3. Comments on the Draft document

3.1. There are a number of concerns that Telemedia has with the Draft Regulations, which will be further delineated below.

3.2. As a long-standing user of FSS in the C-Band, Telemedia are greatly concerned with the potential for harmful interference in the frequency bands 3700 MHz- 4200 MHz, which the Authority seems to have Inadequately addressed in its analysis, both desktop and the minimal field tests that were conducted .

3.3. Telemedia's experience to date with the co-location of BWA services in the ISFR1 band has already rendered a substantial amount of the spectrum band unusable for FSS. Coupled with the current interference resolution mechanisms that exist, adds further to our concerns on the Draft Regulations.

3.4. We note with concern that the Authority seems to be delegating the resolution of harmful interference to an independent third party defined as a USSP in the Draft Regulations. Telemedia submits that there is no enabling provision in the current legislation that empowers the Authority to make such delegation and submits that such a delegation may well be considered *ultra vires* upon review.

3.5. We are also concerned that FSS are regulated and policed by ICASA. The introduction of a 3rd party to police the BWA services will result in the shared spectrum being policed by two organizations which will lead to inefficiencies in the protection of FSS and the roll out of BWA.

3.6. Whilst the Authority may have suggested what appears to be a detailed processes for the registration and enforcement of the operators and equipment used to build BWA networks, this represents little comfort to Telemedia given our experience to date in attempting to resolve harmful interference issues particularly in the 3700 MHz to 4200 MHz bands.

3.7. Telemedia also notes with grave concern that the analysis conducted by the Authority is largely focused on the measurement of interference within the 5800 MHz to 6400 MHz band as opposed to including harmful interference in the 3700 MHz to 4200 MHz band.

3.8. We further note that the tests conducted by the Authority have been substantially limited to a few locations, namely Randburg, Hartebeeshoek and the CSIR. It is deeply concerning that major teleport locations such as that of Telemedia in Rivonia were not included in these tests, not to mention the main satellite teleport of Sentech in Honeydew and that of Globecast in Hyde Park, all three of whom make extensive use of FSS based services in

the impacted frequency bands. This omission raises significant questions as to the credibility and authenticity of the tests conducted by the Authority, the results of which seem to have informed its decision with regard to the Draft Regulations.

3.9. Telemedia submits that the Authority ought to conducted significantly greater testing with regards to the impact of the proposed services in the Draft Regulations by at least including other major industry stakeholders such as, but not limited to Telemedia, Sentech, Globecast, Multichoice, Vodacom, MTN, Telkom all of whom own and operate satellite teleports that have services in the affected frequency bands.

3.10. Telemedia respectfully submits that including more test sites will no doubt lead to more granular test results, which will provide for better decision making and provide further guidance that will serve as a more informed basis for regulations that have such a significant and irreversible impact on companies like Telemedia and others.

3.11. The fundamental flaw in the sharing of spectrum between terrestrial BWA services and FSS is that the difference of the signal power between a terrestrial service and satellite services are several orders of magnitude different.

3.11.1.1. Terrestrial signals transmit at high power and are received at high power.

3.11.1.2. FSS signals, by comparison are transmitted from 36000 km away by geostationary satellites, the signal is distributed over large geographic areas encompassing entire countries and continents, after the signals are distributed over such large areas the signal strength is very low and are received by large satellite antennae coupled to very sensitive, wide band, equipment commonly called LNB's or LNA's.

3.11.1.3. The FSS antennae are directional, but that does not make them uni-directional. The typical gain pattern of any antenna has reception capabilities in all directions in a 3 dimensional space, they have main lobes, side lobes and back lobes. Combined with the highly sensitive wide band LNBs (or LNA's) that

FSS systems use, the inputs are extremely suspectable to interference from all directions.

3.11.1.4. The LNB inputs are typically wide band with a very high gain, this makes satellite reception very susceptible to interference from terrestrial transmitters using the same or adjacent frequencies in the same band.

3.11.1.5. Consequently any tests or trials that are conducted to determine the levels of interference between FSS satellite systems and terrestrial based BWA systems in the same band must take due consideration of the above issues.

3.11.1.6. Similar tests have been conducted in other jurisdictions and it is notable that the ITU have issued papers that ultimately state that sharing of spectrum is possible BUT that geographic separation is critically important to prevent interference to FSS as primary users of the band. The general consensus from ITU papers calls for geographic separation somewhere be 40 km and 100km.

3.12. Telemedia is deeply concerned that whilst the regulation purports to protect FSS, it will only do so in circumstances where existing FSS locations are registered in a database with the Authority.

3.13. This approach represents the following major concerns for Telemedia:

3.13.1. The protection is limited to locations that are registered with the Authority, which means that any future location will not be guaranteed protection from harmful interference, consequently limiting any expansion of FSS services in the proposed bands.

3.13.2. There does not appear to be a mechanism in the Draft Regulation to cater for occasional use services where FSS services are deployed for a limited duration event such as news or sports events, rendering the use of Satellite services in 5800 MHz to 6400 MHz band unprotected for occasional use links both locally and internationally. Similarly, this would be applicable for the reception of occasional use services in the 3800 MHz to 4200 MHz band, unless these are registered with the Authority.

3.13.3. It is common cause that receive only services that make use of FSS were never required to be registered. Telemedia is concerned that the Draft Regulations may have the unintended consequence of creating regulations that require receive only terminals to now follow a registration process.

3.13.4. If the Authority were to consider the new registration requirement in combination with the need for geographical separation and if the Authority is to accept the ITU recommendations on geographical separation, Telemedia submits that it would indicate that most of the land mass of South Africa would be unusable for terrestrial based BWA service to operate in the country without violating the geographic separation requirement.

3.14. Under section 11 of the Draft Regulations:

3.14.1. It seems to be important to the Authority to have noted parameters like polarization. Telemedia submits that polarization for satellites is with reference to the equator. The horizontal and vertical is not in the same plane when away from the equator for terrestrial services compared to satellite services. Isolation from a polarization point of view between terrestrial and satellite signals is not going to be possible. Moreover, FSS also uses a variation of circular and linear polarizations, which is also not catered for in the Draft Regulations or the technical analysis conducted by the Authority.

3.14.2. The Draft Regulations states in S 11 (5) (c) that when calculating OP's the USS shall *"adhere to the protection criterion of I/N = -10.5 dB, <u>not to be exceeded</u> for 20% of the time …"* (own emphasis). It is concerning to Telemedia that this provision has been allowed into the Draft Regulations, in that what this means is that ISD's are "allowed" to exceed the protection criteria for 20% of the time. Consequently, The Authority is advocating, in the Draft Regulations, that FSS services can only ever offer an 80% service level availability, which is hardly within the norm for broadcast services as 20% represents a substantial number of hours of outage caused by "allowable harmful interference" according to the Draft Regulations. The reality is that as the primary user of the band FSS services should experience zero outages

caused by harmful interference, consequently the ISD should never cause harmful interference and thus the Draft Regulations ought to be amended to state as much and where harmful interference is reported the Authority must immediately, in real time, instruct all ISD's to cease all operations with immediate effect so as not to cause undue prejudice to the primary FSS user of the band.

3.14.2.1. The Draft Regulations further requires registration of ISD base stations, amongst other things, this is intended to control and protect the FSS service from the ISD base stations. As noble as this appears, there is no clarity on the how the Authority intends to control emissions from the end user devices of the BWA network. What is the remedy for the FSS user as a primary user of the band to address harmful interference caused by an end user device connected to a registered base station of the BWA network

3.14.2.2. The Draft Regulations references many metrics that ISDs must achieve to protect the FSS systems, but since the metrics were confirmed by what we believe to be incomplete and flawed tests, we doubt the values suggested will protect FSS.

3.14.2.3. Point 5 in section 11 states that the authority will only consider cases where the center-to-center frequency offset between the ISD and the FSS receiver is 2.5 times the bandwidth. This does not consider the out-of-band interference caused by flooding of the FSS antenna and LNB input due to the high-power levels from the terrestrial BWA services. We have seen how terrestrial interference at 3.7 GHz makes the reception of FSS signals up to 4Ghz impossible.

3.14.3. The interference mitigation proposal contained in Section 12 of the Draft Regulations, are impractical and require substantial amendments to be of any meaningful effect.

3.14.3.1. Telemedia is concerned that incumbent primary users can only report instances of harmful interference to the Authority only in conditions where the primary user has complied with S 11 (1) and (2). This means that any FSS

service, as a primary user of the frequency band has no right to protection without having first complied with a new requirement contained in the Draft Regulations, such new requirement being that of registration.

3.14.3.2. Similarly 12 (2) seems to imply that only once harmful interreference has been found will the USSP be required to suspend all spectrum assignments to all ISD's. This is particularly problematic as there is no consideration or description in the Draft Regulations as to how long the process will take between the FSS user reporting harmful interference to the Authority and the time that harmful interference is found. Furthermore, this clause of the Draft Regulations seems to abdicate the Authority from its obligation to prevent harmful interference to primary users of the frequency band and rather delegates the obligation to the USSP. Telemedia would caution the Authority against this approach as the delegation of its obligations may not survive review. Ideally, the Authority ought to have real time mechanisms for the reporting of harmful interference and the Authority should have the ability to suspend all ISD's that are suspected of causing the reported harmful interference in real time without being reliant on the USSP.

4. Results of the Simulation and trials

4.1. Telemedia have a number of objections and concerns regarding the simulated tests contained in the Draft Regulations.

4.1.1. Having reviewed various international studies, the overwhelming consensus is that they all warn of the challenges associated with re-use of the C-band frequencies for terrestrial services. Most of the recommended geographical separations are typically in the order of about 100plus kilometres. We note with concern that the test results seem to have not taken cognisance of these studies or recommendations nor is there an apparent indication of the actual geographical separation utilized. Moreover, we are deeply concerned that only 3 test sites were utilized for the simulation and to utilize sites such as Hartebeeshoek that has natural terrain as

interference barriers calls to question the authenticity and integrity of the simulation.

4.1.2. Telemedia has noted with concern that it was not included in these simulations, as the owner and operator of one of the largest teleports in South Africa we find this to be somewhat inexplicable. It is our understanding that other major Teleport operators may have also been excluded from these simulations and this raises even further concerns regarding the authenticity of the simulations.

4.1.3. The observation that 84% of FSS are in Johannesburg (Gauteng area) is an irrelevant point. The importance of the remaining 16% outside of Johannesburg should not be underestimated. FSS provides reliable connectivity to remote areas where terrestrial networks cannot reach.

4.1.4. The point that most FSS receive sites have look angles between 27 and 63 degrees elevation suggests the minority are not important. It also suggests that because the look angle is high, it is not susceptible to terrestrial interference. As mentioned, an FSS receiver is susceptible to interference from all directions.

4.1.5. The point that 98% of all FSS operating in the 5925 to 6425 Mhz. This is simply inaccurate, or an incomplete statement. FSS use the mentioned frequency for earth to space transmission. It seems to be left out that FSS uses 3.8 to 4.2 GHz for Space to the Earth transmission and it is this 3.8 to 4.2 GHz band that is of concern. There are also more receive only Earth Stations than there are transmit stations, making the use of 3.8 to 4.2Ghz more popular than the 6Ghz transmit (Earth to Space) frequency range. The statistic does not seem correct.

4.1.6. FSS's include satellite networks where multiple Receive Only Earth Stations are fed from a common transmission. The receive only Earth Station is commonly known as a TeleVision Receive Only (TVRO). The concept is widely used to provide contribution broadcast signals to terrestrial transmitters. These TVRO sites are distributed thought the country.

4.1.7. Despite having built a database of existing Earth stations using C-band, it is surprising that only Hartebeeshoek and Randburg were part of the test cases for interference measurements.

Other obvious Teleports that were not included, are:

Telemedia Rivonia Teleport

Vodacom Midrand

MTN Gallo Manor

Globecast Hyde Park

SABC Auckland Park

Teraco (Isando)

The Key national television signal distribution sites, such as Sentech in Honeydew and all of the nationwide DTT receive sites were also not included.

4.1.8. The test site chosen to the IDS hub, is surrounded by hills that are less than 5km away, making a natural geological barrier to the inference test sites. This is not an ideal test site, the very nature of a terrestrial base station is to have as large a coverage area as possible. This is naturally achieved by placing the base stations at the top of ridges, not in the valleys below them. The table in section 10 of the Draft Regulations states the height above ground for an ISD deployment but does not regulate the height of the mountain that the transmitter might be erected on.

5. Conclusion

5.1. Telemedia would like to thank the Authority for the opportunity to be able to comment on the Draft Regulations.

5.2. Telemedia is strongly opposed to the Draft Regulations in its current form and would suggest that the Authority review its position on these Draft Regulations for

all the reasons and concerns articulated in this submission. It is our view that substantially more testing and simulation needs to be conducted in a much more collaborative approach with a broader audience including, but not limited to Telemedia, Sentech, Multichoice, Globecast, Vodacom, MTN, Telkom and other major industry players who own and operate FSS facilities within the Republic.

5.3. Telemedia welcomes the opportunity to work closer with the Authority to conduct much more detailed testing and simulations, that will only serve to further enhance and inform the Authority's position on its next draft of these regulations.

5.4. Telemedia reserves all its rights in this matter.

I'