30 May 2025

Vodacom's Submission to the Authority's
"DRAFT REGULATIONS ON DYNAMIC SPECTRUM ACCESS AND OPPORTUNISTIC SPECTRUM MANAGEMENT IN THE INNOVATION SPECTRUM 3800 – 4200 MHZ AND 5925 – 6425 MHZ"

1. INTRODUCTION

Vodacom Pty Ltd ("Vodacom") wishes to thank the Independent Communications Authority of South Africa (ICASA) for the opportunity to make a submission on the Authority's "DRAFT REGULATIONS ON DYNAMIC SPECTRUM ACCESS AND OPPORTUNISTIC SPECTRUM MANAGEMENT IN THE INNOVATION SPECTRUM 3800 – 4200 MHz AND 5925 – 6425 MHz" as published in the Government Gazette No. 52415 on 28 March 2025.

Vodacom commends ICASA for its initiative to engage in early consultation to assess the maturity of new technologies, such as Dynamic Spectrum Sharing (DSS). This advance consultation is crucial for guiding the decision-making in terms of deployment of new technology.

2. GENERAL COMMENTS

Vodacom appreciates that the Authority has considered some of its previously proposed recommendations, in particular that the use of Dynamic Spectrum Sharing (DSS) techniques, be applied only in non-IMT bands or those not earmarked for IMT in the future.

Vodacom has previously proposed that national and regional primary licensees should retain exclusive rights to their spectrum to prevent interference within their networks. However, the current draft does not ensure future protection for primary, or even secondary, licensees. The proposed model does not clearly specify whether regional primary licensees will be allowed to lease part of their exclusive rights to DSA on a voluntary basis. Although it highlights that interested network operators must apply for the innovation spectrum on a geographical basis, it does not explicitly prohibit large-scale deployment, that could have the effect of locking out other nascent temporary network providers from DSA use, somewhat in conflict with the Authority's stated objective of introducing DSA.

In our prior submission on the DSS topic, Vodacom proposed a model for the Authority's consideration regarding the implementation of DSS. Vodacom outlined a potential tiered system approach, where the application of DSS would vary based on the type of license. As illustrated in Figure 1, the tier system model recommended by Vodacom shows that ICASA's proposed model corresponds with tiers 3 to 4, as highlighted for each innovation spectrum frequency range.

Bands licensed to national licensees in tiers 1 and 2 should be entirely excluded from DSS to avoid hindering future deployments if they do plan to expand their footprints in these areas.

In contrast, regional primary licensees should be allowed to participate temporarily on a short-term and voluntary basis. It is important to note that a primary license holder in tier 3 retains the right to provide services according to their license and to expand their coverage over time to areas that are not currently served, and if needed secondary licensees must vacate the band in those areas

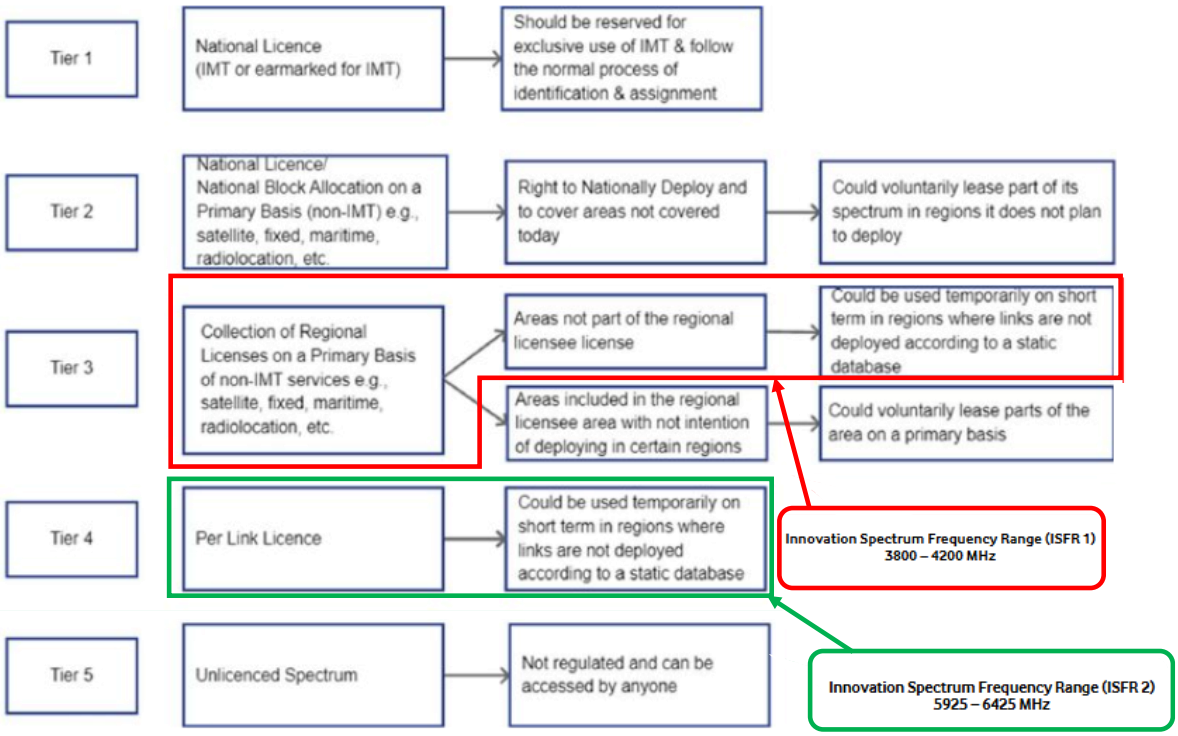

Figure 1: Potential DSS Use-Cases based on Licence Type

2.1 Proposed Measures to Prevent Harmful Interference

The Authority must consistently protect the rights of permanent primary and secondary licensees by ensuring that temporary licensees granted DSA adhere to specified locations and applications and also implement geo-boundaries to prevent co-channel interference. The Federal Communication Commission (FCC) adopted rules in their proceedings to facilitate sharing between a new Citizens Broadband Radio Service (CBRS) and federal incumbents in the 3550-3650 MHz band (3.5 GHz Band)[1]. Their tiered sharing framework is enabled by a Spectrum Access System (SAS), which is the network-based system for authorizing commercial use of the band, acting as the frequency coordinator for Priority Access (PA) and General Authorized Access (GAA) tier users. The SAS serves as an automated frequency coordinator across the band. It protects higher tier users and ensures that lower tier users do not transgress the rights of higher

[1] https://docs.fcc.gov/public/attachments/FCC-15-47A1.pdf

tier users and also optimizes frequency use to allow maximum capacity and coexistence for both GAA and Priority Access users.

The FCC has appointed one or more SAS administrators in accordance with the functional requirements outlined in the FCC rules[1]. These administrators will provide service for a period of five years, with the possibility of renewal at the Commission's discretion. In the proposed DSA draft regulations, ICASA doesn't clearly outline the selection criteria and functional requirements for the proposed Unified Spectrum Switches Provider (USSP). Vodacom recommends that through a fair and transparent process, the Authority must allow multiple entities to apply for certification to operate as the USSP. Through this approval process, applicants will be able demonstrate their ability to meet the USSP functional requirements as pre-defined by the Authority.

The FCC proposed framework is designed to prevent harmful interference between users through the SAS. The National Telecommunication and Information Administrator (NTIA) recommended the Environmental Sensing Capability (ESC) as a functional element of the regulatory framework to augment the SAS. The ESC input would be used by the SAS to instruct commercial users to vacate a channel when proximity to federal use (in frequency, location, or time) and to direct the PA and GAA tier users to another channel or, if necessary, to cease transmissions to avoid potential harmful interference to federal radar systems. Although the proposed ICASA framework includes the application of guard bands above and below to protect incumbent services, it is essential for the Authority to establishes coordination mechanisms to further safeguard permanent users by ensuring continuous real-time regulatory compliance. To further prevent harmful interference, Vodacom recommends that the Authority implement a "kill switch" to immediately terminate users' transmissions if the device's location does not align with the specified application location or if there are changes in the technical parameter values. It is recommended that ICASA implement a similar sensing approach that is be employed only in the vicinity of the established exclusion zones, to further protect the permanent licensees. An electronic scanning device can be utilized as an initial measure to effectively address non-compliant users, rather than relying on affected incumbents to report incidents offline to the Authority, resulting in protracted delays and ongoing interference before the errant transmissions are ceased.

2.2 Innovation Spectrum License Validity and Renewal

The proposed maximum duration of three years for spectrum licenses is considered to be excessively long. Permanent Primary and Secondary licensees should be afforded priority over temporary licensees (such as those with DSA), especially when they seek to expand their networks. Vodacom recommends a monthly license review of DSA temporary licensees, which can be revoked immediately upon the deployment of a primary or secondary licensee in an area currently occupied by a temporary licensee. The minimum duration for dynamic spectrum assignment should remain adaptable, while still adhering to the concept of temporarily assigning the unused spectrum to DSA users at a point in time, within a particular frequency band.

2.3 Feasibility study on the 6GHz spectrum in South Africa

According to the draft simulation results, fixed service links receivers operating within the 5925 – 6425 MHz frequency are 49% times more than the FS links operating within the 3800 – 4200 MHz frequency, which indicates that the opportunity to access ISFR-2 are limited compared to ISFR-1. The Authority has confirmed that this band is overutilized, and the current higher elevation angles may impact interference mitigation strategies. In South Africa, this frequency band overlaps with existing deployment of key microwave spectrum, which is analogous to key mobile spectrum in the sub-1GHz range. The draft fails to adequately address the potential impact on the microwave spectrum assignments, as well as the effects on permanent licensees operating within this overutilized band. As far as we are aware, there have been no consultations or feasibility studies conducted to determine how coexistence will be managed and what the potential impacts might be. Neither are we aware of any consultation in this regard. Vodacom recommends that ICASA conduct a feasibility study to inform the co-existence of primary, secondary and temporary DSA licensees within the overutilized 6 GHz band.

3. DETAILED COMMENTS AND RECOMMENDATIONS

3.1. The definition of Equivalent Isotropic Radiated Power (EIRP) as reflected in Section 1(DEFINITIONS) appears to be technically incorrect. As we understand it, a decibel value (such as dBm) cannot be multiplied with another value. Such values can only be added or subtracted. Furthermore, it may be confusing readers to refer to "absolute or isotropic antenna gain relative to an isotropic antenna", which may lead to misinterpretation.

Instead, it is recommended that the Authority rather refer to "antenna gain relative to that of an isotropic radiator". This is usually specified as a decibel value (dBi) and added to the power value (in dBm) to obtain an EIRP value (in dBm).

3.2. We observe that various terms are used throughout the draft regulations to refer to wireless equipment, for example “base station”, “access point”, “customer premises equipment”, “end user equipment”, “fixed devices”, “mobile devices” etc. However, we were not able to clearly identify how these abovementioned terms relate to "master device" and "client device", which seem to be the terms that are used to describe a generic IS system in the draft regulations. The Authority is requested to update the draft regulations, such that the terminology is consistently applied.

3.3. We also note that the tables in Sections 10(2) and 10(3) are inconsistent. In one case, the maximum permitted power is specified as EIRP or TRP values, while in the other table no such distinction is made. The same inconsistency also applies for the spectral distribution of power. The Authority is requested to update the tables to ensure that they are both consistent and complete, in order to prevent misinterpretation of the regulations.

3.4. In Section 11(1), it is stipulated that an incumbent user must register with the Authority. It is not clear as to what such a registration would entail, and such a requirement has the potential to become administratively burdensome for certain licensees. Given that the Authority ought to already have the details of such incumbents, this new requirement appears to be inefficient. The Authority is thus requested to consider alternatives to its registration requirements for incumbents

3.5. We note that a number of the stipulations under Section11(5) are unclear or open to misinterpretation. For example:

a. In subsection (c) it is unclear as to how was the I/N value of 10.5 dB derived.
b. In subsection (e) it is not apparent as to whether the bandwidth refers to the ISD system or the FSS system?
c. In subsection (g) it is unclear as to what is meant by “protection of FS receivers, not to be exceeded for 20% of the time”. In particular, we would have expected that FS receivers, used by primary licensees, would receive protection 100% of the time.
d. In subsection (h) the protection ratio is not clearly specified. For example, a single value (such as -10.5 dB), is overly simplistic as these ratios are typically derived for the interaction between the various permutations of specific technologies. We would have expected that aspects such as various frequency profiles, centre-frequency separations, modulation schemes, would be considered when developing comprehensive protection criteria for coexistence.
e. In subsection (j) it is unclear whether the bandwidth refers to the ISD system or the FS system?

f. For subsection (l.) a reference is made to Table 3, which we were unable to location in the document.

3.6. In subsections 12(1) and 12(6), the responsibility for reporting and resolving interference is seemingly shifted to the incumbent users of the spectrum. As incumbents hold permanent spectrum licenses, we would expect that they should not bear such responsibilities. Instead, we would expect that if the Authority decides to introduce temporary DSA licensees in a band, with the risk of interference being caused to permanent licensees, which would amount to deprivation of the permanent licensees' rights, then the Authority needs to itself ensure that there is adequate monitoring and oversight such that permanent primary and secondary licensees are not interfered with.

3.7. In section 15, the calculation of the operating parameters by the USS for ISD transmissions appear to be based solely on software propagation modelling, as well as limited field measurements. The Authority is requested to clarify whether the chosen propagation model has been validated with actual full-system measurements with all components in place, and specifically the manner in which the validity of the operating parameters are going to be verified in practice. We recommend that an effective form of monitoring capability be implemented to ensure the proper functioning of the USS system.

3.8. The Authority is not sufficiently clear on the manner in which interference between IS operators is going to be handled. For example, it is not apparent as to who would be responsible for reporting and resolving such matters.

4. REQUEST FOR CLARIFICATION

Vodacom kindly requests that the Authority provide further clarity and consult on the following aspects prior to embarking on the development of regulations in regard to DSA/DSS:

1. The Authority's plan regarding the regulation of temporary DSA licensees, particularly with regard to the licensing process and the establishment of technical controls, such as power limits.
2. The responsibility for managing, maintaining, and securing the database. In particular, it is unclear whether it be an ICASA-owned platform, a third-party administrator (as in the CBRS model), or a public-private partnership.
3. The governance mechanisms that will be in place to ensure transparency, reliability, and regular updates to the database, particularly regarding the protection of incumbent primary and secondary licensees.

4. The regulatory controls that will be implemented to prevent spectrum squatting by temporary DSA licensees are unclear.
5. The usage limits set by the Authority for temporary DSA licensees to encourage fair and efficient access to shared spectrum is unclear.

5. CONCLUSION

Vodacom acknowledges the consultative and forward-looking approach taken by the Authority in these draft regulations. While DSA might hold the potential for incremental spectrum efficiencies and innovation opportunities, its success depends on ensuring non-disruptive coexistence with existing networks, robust interference safeguards, and a transparent coordination mechanism. Vodacom respectfully requests that the Authority take the aforementioned recommendations into consideration as it finalizes the DSA regulatory framework.