11 June 2025

Subject: Plan-S Comments on the ICASA's Draft National Radio Frequency Plan 2025

Dear Mr. Moshweunyane and Mr. Makgotlho,

On behalf of Plan S Satellite and Space Technologies Inc. (Plan-S), we would like to express our gratitude for the opportunity to share our proposals on the Draft National Radio Frequency Plan outlined in the Annex. We commend ICASA for its diligent efforts to review the National Radio Frequency Plan, incorporating international developments, including the outcomes of the World Radiocommunication Conference 2023 (WRC-23), to enhance the social and economic value of spectrum in South Africa.

We sincerely appreciate the opportunity to contribute to this consultation. Furthermore, we kindly request the chance to make an oral representation during the planned public hearings to introduce our proposals. This would allow us to elaborate on our submission and proposals meaningfully to the consultation process. We remain dedicated to supporting ICASA's studies to optimize spectrum usage for the benefit of South African citizens and industries.

Respectfully submitted,

Fazlı KAYBAL

Spectrum and Regulatory Affairs Manager

Annex: Comments on Draft National Radio Frequency Plan

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As the Internet of Things (IoT) ecosystem grows, the need for dependable, cost-effective, and global connectivity becomes increasingly critical to enhance efficiency of business operations in various industries, which will eventually contribute to the country's economy. Satellite IoT technologies, including those based on 3GPP and LoRaWAN standards, offer numerous advantages such as extending coverage to remote and underserved areas where terrestrial networks are impractical or economically unviable and providing resilient connectivity that is less susceptible to natural disasters or terrestrial infrastructure failures.

As a satellite operator, we are committed to addressing global coverage challenges and advancing a sustainable future for the IoT ecosystem. **CONNECTA IoT Network, a cutting-edge solution optimized for massive narrowband IoT connectivity based on LoRaWAN and 3GPP standards[1], offers unparalleled cost efficiency, high reliability, high capacity, low latency, comprehensive global coverage, and standardized industry-leading technology solutions**. Additionally, CONNECTA IoT Network will provide global connectivity capacity through a low-cost constellation for billions of devices. Its LEO architecture and innovative standardized offerings allow customers to use IoT solutions at a low cost anywhere in the world where the service is authorized.

While satellite IoT offers significant potential to enhance global connectivity, particularly in remote and underserved areas, its growth can be limited by challenges in spectrum access. Much of the MSS spectrum is already controlled by incumbent operators, making it difficult for new entrants to obtain the frequencies needed to provide their services. **This could hinder competition, slow innovation, and limit the range of applications satellite IoT could support.**

To fully harness the benefits of technological advancements, it is recommended that national spectrum plans be updated to align with current and emerging technological developments, requirements, and new international regulatory advancements. WRC-23 has underscored the importance of reassessing existing spectrum allocations and added a new agenda item, i.e. AI 1.12, to consider the necessity of additional bands for satellite IoT applications or low-data rate MSS. Additionally, technologies currently used in terrestrial networks, such as LoRaWAN and NB-IoT, are now ready for deployment in satellite networks. These developments point to a growing spectrum need for satellite IoT services that brings efficiency of business operations across multiple industries.

National frequency plans and spectrum regulations may fall short of meeting the rapidly evolving needs of the satellite IoT ecosystem. They often fail to adequately address recent technological advancements, such as the use of LoRaWAN and NB-IoT technologies for satellite IoT communications. These limitations can lead to a less competitive market by creating barriers to the entry for new players and hindering service deployment, particularly in frequency bands that are technically suitable but not yet allocated for satellite-based operations.

To foster innovation, it is recommended that spectrum management frameworks be reviewed and updated to reflect technological advancements and international

[1] Connecta IoT Network utilizes the 862-870 MHz or 902-928 MHz bands, depending on their availability in respective jurisdictions, for its LoRaWAN-based solutions. Additionally, it operates in the 2 GHz MSS band employing NB-IoT technology based on 3GPP standards.

regulatory developments, based on technical studies, without being limited solely to the outcomes of WRC-23 decisions.

In this context, it is considered important to explore alternative spectrum options that may complement existing MSS allocations and support the continued growth of satellite IoT services. Among these, the use of Short-Range Device (SRD) frequency bands for satellite IoT has emerged internationally, i.e. in CEPT, as a technically feasible and scalable approach for global deployments.

Accordingly, the following proposals are respectfully presented for your consideration:

1. **Utilization of the 862-870 MHz frequency band, currently not allocated for MSS or any satellite services in the Draft National Radio Frequency Plan, for satellite IoT services**.
2. **Utilization of the 1980-2010 MHz and 2170-2200 MHz frequency bands to support solutions for satellite IoT connectivity.**

These proposals are reflecting international trends and technological advancements and are aimed to contribute to a flexible and future-oriented spectrum management framework.

1. New allocation for non-specific SRDs and enabling the 862-870 MHz band for satellite IoT connectivity

SRD bands offer a promising solution for satellite IoT by enabling low-power, global and resilient connectivity with interoperability with existing terrestrial networks based on the same technology. While not traditionally allocated for satellite services, SRD bands, already widely used in terrestrial LPWAN such as LoRaWAN, demonstrate strong potential for interoperability when extended to satellite use. Recent technical trials have confirmed the suitability of LoRaWAN in license-exempt SRD bands for satellite IoT, enabling low-cost, energy-efficient, and robust communication. Regulatory advancements, particularly within CEPT, are being prepared to allow such use with the constraints such as in-band and out-of-band pfd limits to ensure coexistence with terrestrial systems and applications. Extending license-exempt SRD regimes to satellite networks provides a harmonized, low-barrier path for global IoT deployment and supports broader adoption through alignment with international best practices and technical standards.

In this context, we would like to highlight a recent development within CEPT regarding the enablement of satellite-to-SRD (Low-Power Devices communicating with Satellites, LPD-S) communication in the 862-870 MHz band. The feasibility and compatibility of satellite-to-SRD transmissions with existing applications and services have been extensively studied in ECC Report 357 and subsequent CEPT works. Consequently, satellite-to-SRD transmissions in the 862-870 MHz band can be considered an extension of the license-exempt SRD regime into satellite services, further improving spectrum efficiency in this band.

CEPT is now preparing to adopt ECC Decision (25)02 in June 2025, which sets conditions to ensure the efficient use of spectrum for satellite-to-SRD communications. Additionally, the EU's Radio Spectrum Policy Group (RSPG) has included this concept in its draft Opinion on satellite Direct-to-Device (D2D) communications. It recommends that the European Commission incorporate satellite-to-SRD communications into its permanent SRD mandate

to CEPT. This would facilitate the establishment of harmonized technical specifications for satellite downlinks in the SRD bands. Additionally, RSPG asks Member States to develop authorization frameworks that support SRD-based satellite communications throughout the EU.

Extending SRD bands to include satellite services acts as a form of NTN, effectively bridging gaps in terrestrial network coverage and creating new opportunities for both satellite operators and terrestrial LPWAN operators. By incorporating satellite connectivity, LPWAN operators can expand their network reach to rural, remote, and underserved areas, enabling seamless cross-border IoT operations. This expanded coverage allows operators to support innovative use cases that were previously impractical due to connectivity limitations, such as large-scale agricultural monitoring, global asset tracking, and maritime and environmental conservation projects.

These advancements signify a transformative shift in the global regulatory landscape, enabling the seamless integration of satellite IoT operations into unlicensed spectrum frameworks and fostering the growth of IoT ecosystems.

Application of the Proposal:

As illustrated in Figure 1, the 862-870 MHz frequency band is not currently allocated for any satellite services similar to any Region 1 countries in the Draft National Radio Frequency Plan. While this band is not presently allocated for satellite services in South Africa, it has been recognized internationally, i.e. CEPT, as suitable for satellite IoT applications, as detailed above.

862-890 MHz FIXED MOBILE except aeronautical mobile 5.312B 5.317A BROADCASTING 5.322	**862-890 MHz** FIXED MOBILE except aeronautical mobile 5.312B 5.317A NF10	Fixed Links (856 – 864.1 MHz) Wireless Access (872.775 877.695 MHz) GSM-R MTX (877.695 – 880 MHz) NF10 IMT900 MTX (880-915 MHz) IMT850 BTX (870-875 MHz) Wireless Audio systems and Wireless microphones (863 – 865 MHz) CT2 cordless phones (864.1 – 868.1 MHz) FWA (864.1 – 868.1 MHz) RFID (865 – 868 MHz) Non-specific SRD and RFID (869.4 – 869.65 MHz)	Paired with 868.1 – 876 MHz Paired with 827.775 – 832.695 MHz Paired with 921 – 925 MHz Paired with BTX (925 – 960 MHz) Paired with MTX (825-830 MHz) Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Recommendation ITU-R M.1036-6 Radio Frequency Spectrum Assignment Plan GG 42337 Notice 165 of 2019 Radio Frequency Spectrum Assignment Plan (GG 38640 Notice 275 of 2015) as amended
ITU Region 1 allocations and footnotes	**South African allocations and footnotes**	**Typical Applications**	**Notes and Comments**
5.319 5.323		Non Specific SRDs (868 – 868.6 MHz, 868.7 – 869.2 MHz, 869.4 – 869.65 MHz, 869.7 – 870.0 MHz) Alarms (868.6 – 868.7 MHz, 869.25 – 869.3 MHz, 869.65 – 869.7 MHz) HIBS – Resolution 213 (WRC-23) applies	International Mobile Telecommunication Roadmap GG No.42829 Notice 600 of 2019).

Figure 1: Draft National Radio Frequency Plan Allocations for 862-890 MHz

In this regard, we propose that ICASA consider enabling the utilization of the 862-870 MHz frequency band for satellite-to-SRD/LPD-S communications by incorporating a

new corresponding footnote, NFXX. Incorporating this concept into the national regulation, aligned with the rules defined in ECC Decision (25)02, would facilitate the introduction of this innovative application in South Africa. Such an initiative would align South Africa with global best practices, enhance spectrum efficiency, and support low-power, resilient IoT connectivity, particularly in rural and underserved areas.

NFXX: *The 862-870 MHz band is also used for low-power devices communicating with satellites, subject to the following conditions:*

1. *The PFD of space-to-Earth transmissions does not exceed -142 dB(W/(m².4kHz)) on the surface of the Earth within 862-870 MHz. The unwanted emissions of space-to-Earth transmissions do not result in a PFD value higher than -146 dB(W/(m².1MHz)) on the surface of the Earth outside the frequency range 862-870 MHz. A letter is obtained by the ICASA from the notifying administration of the space system where it commits to comply with both PFD limits.*
2. *The Earth-to-space receivers of the space stations operate under the licence of a notifying administration with an explicit text "that if the space station includes a receiver, the interception of radiocommunication correspondence, other than that which the station is authorised to receive, is forbidden, and that in cases where such correspondence is involuntarily received, it shall not be reproduced, nor communicated to third parties, nor used for any purpose, and even its existence shall not be disclosed" (see Articles 17 and 18.4 of the Radio Regulations). This licence or a letter from the notifying administration to the ICASA is provided to justify the commitment of compliance.*

These criteria are designed to protect SRD applications on the ground and to safeguard mobile services adjacent to the 862-870 MHz band from any unwanted satellite emissions. We would be happy to provide additional details and background on the rationale behind these PFD values. Furthermore, for instance, our use of 862-870 MHz frequency band in Europe has successfully validated the coexistence with other services and applications, as well as the feasibility, reliability, and efficiency of our satellite-based IoT solutions.

Moreover, while ERC Recommendation 70-03, referred to in "The Radio Frequency Spectrum Regulations 2015," allows the use of the 862-870 MHz band for Non-Specific SRDs, the National Radio Frequency Plan allows only the 868-870 MHz portion for this application. We respectfully request that Non-Specific SRD allocations be extended to the full 862-870 MHz range or the largest range possible, compatible with ERC Recommendation 70-03.

The section of Annex-1: Non-Specific Short-Range Devices from ERC Recommendation 70-03 for the 862-870 MHz band has been extracted from the latest version (sent for the public consultation) and is provided in Figure 2. We propose incorporating the amendments covering the entire 862-870 MHz frequency range, as outlined in this Recommendation, into the National Radio Frequency Plan.

h0	862-863 MHz (note 6)	25 mW e.r.p.	≤ 0.1% duty cycle	≤ 350 kHz		EN 300 220	
h1.0	863-870 MHz (notes 2 and 6)	25 mW e.r.p.	≤ 0.1% duty cycle (note 1)	≤ 100 kHz for 47 or more hop channels		EN 300 220	For FHSS. Parts of the frequency band are also identified in Annexes 2, 3, 10 and 11
h1.2	863-870 MHz (notes 2 and 6)	25 mW e.r.p. -4.5 dBm/100 kHz e.r.p.	≤ 0.1% duty cycle or LBT+AFA	Not specified		EN 300 220	For non-FHSS. Parts of the frequency band are also identified in Annexes 2, 3, 10 and 11
h1.3	863-865 MHz (note 6)	25 mW e.r.p.	≤ 0.1% duty cycle or LBT+AFA	Not specified		EN 300 220	The frequency band is also identified in Annexes 3 and 10
h1.4	865-868 MHz (note 6)	25 mW e.r.p.	≤ 1% duty cycle or LBT+AFA	Not specified		EN 300 220	The frequency band is also identified in Annexes 2, 3 and 11
h1.5	868-868.6 MHz (note 6)	25 mW e.r.p.	≤ 1% duty cycle or LBT+AFA	Not specified		EN 300 220	
h1.6	868.7-869.2 MHz (note 6)	25 mW e.r.p.	≤ 0.1% duty cycle or LBT+AFA	Not specified		EN 300 220	
h1.7	869.4-869.65 MHz (note 6)	500 mW e.r.p.	≤ 10% duty cycle or LBT+AFA	Not specified		EN 300 220	
h1.8	869.7-870 MHz (note 6)	5 mW e.r.p.	No requirement	Not specified		EN 300 220	
h1.9	869.7-870 MHz (note 6)	25 mW e.r.p.	≤ 1% duty cycle or LBT+AFA	Not specified		EN 300 220	

Figure 2: The part of ERC Recommendation 70-03 for the 862-870 MHz band – Non-Specific SRDs

As a result, the part of the 862-890 MHz band, incorporating our proposed revisions, is shown in Figure 3. The additions and amendments are highlighted in yellow for clarity.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical applications	Notes and comments
862-890 MHz …	**862-890 MHz** … **NFXX**	… Non Specific SRDs (862-863 MHz, 863-870 MHz, 863-865 MHz, 865-868 MHz, 868-868.6 MHz, 868.7-869.2 MHz, 869.7-870 MHz)	…

Figure 3: The proposal for the enablement of satellite-to-LPD-S in the 862-870 MHz band and new allocations for non-specific SRDs

The adoption of this proposal could bring significant socio-economic benefits to South Africa by enhancing spectrum efficiency, introducing a new dimension to spectrum usage, enabling interoperability with existing networks, and safeguarding current users in the band. Additionally, this will ensure alignment with best practices. This initiative would support transformative use cases in key sectors such as agriculture, mining, livestock, energy production, environmental monitoring, logistics, and maritime operations, aligning with and advancing the goals outlined in Digital Economy Master Plan of South Africa.

2. Dedicating spectrum in the 2 GHz MSS band for satellite IoT connectivity

The 2 GHz MSS band has gained significant industry interest for direct-to-device and IoT applications due to its favorable signal characteristics, existing device ecosystem, and harmonized availability across ITU regions. In response, administrations are beginning to revisit spectrum plans for this band.

We would like to emphasize that NB-IoT technologies based on 3GPP Release 17 and beyond, operating in the MSS bands (e.g., the 2 GHz MSS band), provide an ideal solution for IoT services as they complement mobile networks based on 3GPP standards through interoperability, seamless coverage, and resilience.

The 2 GHz MSS band identified within 3GPP for IoT-NTN and NR-NTN are crucial for enabling innovative satellite-based MSS solutions due to their globally harmonized allocation, strong

signal propagation characteristics, and interoperability with terrestrial mobile networks for seamless coverage and backup connectivity in case of disruptions.

We recommend that ICASA consider dedicating a portion of the 2 GHz MSS band to IoT applications on a shared basis, similar to the approach implemented in Australia[2] and as highlighted by the RSPG in its document titled *"RSPG Opinion on Assessment of Different Possible Scenarios for the Use of the Frequency Bands 1980-2010 MHz and 2170-2200 MHz by the Mobile Satellite Services Beyond 2027."* This would support the growth of satellite IoT applications while ensuring efficient spectrum utilization.

[2] ACMA has authorized the frequency bands of 2005-2009 MHz and 2195-2200 MHz on a shared basis for the use of narrowband Mobile-Satellite Services (MSS) in Australia (see here). Likewise, as an option (Option 2 in the Report), RSPG proposes shared use of 2x5 MHz in the 2 GHz MSS band to address IoT/M2M demands as some time sharing is considered possible for IoT/M2M (see here).