Utilities Regulation &
Competition Authority
The Bahamas

Public consultation ECS 75/2024: on the Regulatory framework for satellite-based electronic communications services in The Bahamas

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Introduction

Satelio IoT Services, S.L. (hereinafter Sateliot) is a pioneering Spanish company established in 2018, dedicated to revolutionising global narrowband Internet of Things (IoT) connectivity. Leveraging a constellation of small satellites in Low Earth Orbit (LEO) and utilising the 5G NB-IoT NTN 3GPP Standard Protocol, Sateliot aims to provide cost-effective connectivity for IoT devices and applications worldwide. After the launch of two test satellites in 2021 and 2022, we recently launched our first 4 commercial satellites in August 2024, with the aim to start providing commercial services this Q1 of 2025.

This innovative approach ensures that more terrestrial IoT devices can seamlessly transition to satellite capabilities when terrestrial coverage is unavailable. Our pioneering approach involves providing our capacity to Mobile Network Operators (MNOs) via standard GSMA roaming agreements, who then connect end-user devices, extending their footprint in out-of-coverage areas. By adopting this supplemental connectivity model, Sateliot addresses the pressing challenges of accessibility and continuity of IoT services in underserved and partially served areas which are prevalent in territorial waters and beyond. The transformative potential of IoT technologies extends across various industries, including agriculture, livestock, maritime, transport and logistics, energy, and infrastructure. With its strategic location and diverse economic sectors, the Bahamas presents a unique opportunity for NTN IoT to have a meaningful impact.

Sateliot appreciates the opportunity to participate in this public consultation regarding the URCA's considerations for a regulatory framework for satellite-based electronic communications services in The Bahamas. As a leading innovator in satellite-based Internet of Things (IoT) solutions, we are deeply committed to contributing with our expertise and insights to developing a comprehensive regulatory framework that fosters innovation, promotes competition, and maximises the socio-economic benefits of connectivity for all Bahamians.

Hereafter, we submit our comments on some of the topics presented in the Regulatory framework for satellite-based electronic communications services in The Bahamas.

Developments in Satellite Communications

Q1: Do you have any other comments on the demand and the importance of satellite communication services for The Bahamas? If so, please provide a detailed explanation of these observations, including supporting evidence where available.

As a satellite operator, we consider it particularly crucial to highlight that new satellite communications services introduced innovative satellite technologies, increase end-user choices. As rightfully mentioned by the consultation, M2M and satellite IoT is one of the important emerging technologies that will have a tremendous positive impact in different economic verticals and sectors, such as asset tracking, environmental monitoring, precision agriculture, smart utilises, and logistics both on land and at sea.

URCA has done an admirable job in highlighting recent satellite technology developments and their roles across a range of technologies including FSS, ESIM, MSS, Backhaul and M2M.

The Bahamas, with over 3500km of coastline and approximately 673,396 square kilometres of exclusive economic zone in the Atlantic Ocean, can benefit significantly from satellite services. The Bahamas is home to a large territory of waters where it is practically impossible to gain terrestrial connectivity. Satellite IoT presents a significant value add for maritime logistics for both cargo tracking and vessel monitoring.

Despite the potential benefits derived from the introduction of innovative satellite technology in the Bahamas, we convey that regulatory oversight is hugely important to prevent market distortion, interferences between services, and protect competitiveness. Indeed, we consider centrally important that URCA welcomes the comments and services provided by a variety of operators, regardless of their size and service specifications, so future access to spectrum resources and market entry are managed with the interest of all Bahamians in mind.

As an example, the decision of the European Commission (2009/449/EC) of 13 May 2009, for the allocation of the 2GHz spectrum band with exclusivity to only two satellite operators, has prevented additional operators to provide valuable services in Europe, in a context where these scarce resources are arguably underutilised. This decision led to obstructing competition in a particular satellite band for the MSS, and therefore reduced competitiveness and end-user choices in the IoT market for many years. As such, we are delighted to see that the Bahamas is working on developing a new satellite regulatory framework, in a consultative manner, in communication and in line with the needs of the industry.

Q2: Do you agree with the regulatory and policy objectives to consider in this review and the resulting five key objectives guiding URCA's review?

We support the high level objectives proposed by the URCA in the objectives and praise the Bahamas' forward-looking approach to embracing emerging technology in meeting the goals and objectives set by the ECS Policy. Specifically, we address each objective below:

- *Objective 1: The licensing regime should facilitate the development of satellite-based electronic communications existing services and the market entry of services in all regions of The Bahamas and specifically in the Family Islands.*

  We support this objective and note the need to grow the current satellite sector while still making the market attractive and open for new entrants. We present the Bahamas with a new market opportunity providing M2M services through our standardised 3GPP 5G NB-IoT NTN

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solution. This presents users in the Bahamas with new services and value adds to many different sectors including agriculture, shipping, logistics and energy.

- *Objective 2: The licensing regime should accommodate a wide range of emerging use cases related to satellite technology, including ESIM connectivity, while incorporating safeguards to ensure sustainable competition in the cellular mobile market.*

  Sateliot supports this objective and the intention to create a competitive market for new satellite technologies. However, we urge the URCA to consider which emerging technologies the Bahamas seeks to embrace. Not all emerging satellite technologies have been developed on standardised, well understood, safe and protected processes. Including emerging technologies such as Direct-to-Device in non-internationally harmonised Mobile bands for MSS presents challenges as this model operates non-conformity with the ITU Radio attributions, operating under Art 4.4 of the Radio Regulations.

  Embracing emerging technologies is laudable and commendable to ensure the Bahamas provides the best possible services and connectivity for residents and tourists. However, emerging satellite technologies with a proven track record and founded upon standardised technology should be given preference over those which operate outside the scope of international regulation.

- *Objective 3: The licensing regime should allow operators to provide disaster-resilient network solutions based on hybrid terrestrial and satellite architectures.*

  We support the adoption of a framework which provides for satellite connectivity in a hybrid TN/NTN architecture. However, we reiterate that the model adopted and encouraged should not be operating MSS in a non-conforming manner in traditional mobile bands.

  It is worth highlighting that there is no reference in the Radio Regulations on how administrations should activate or utilise emergency satellite connectivity with novel technologies such as Direct to Device. The use of emergency communications, owing to its critical nature and dependence, requires regulatory certainty. There can be no doubt as to the efficacy or approval of an emergency communication technology. This makes operators who employ technology under Art 4.4 ill suited to emergency communications as such technology operators under a non-protected basis. This would also increase the complexity of national and regional planning. It is safer and more responsible to rely on standardised technology for emergency communications.

- *Objective 4: The spectrum bands dedicated to satellite operators should be used efficiently, with safeguards to prevent interferences with other users.*

  We support this objective. The efficient use of spectrum and its protection from harmful interference is in everyone's best interests in the regulator, the consumer and the operators. To this end, the objective could encompass possible incentives for operators who use spectrum efficiently and effectively to provide their services. One example of an incentive could include expedited market entry.

- *Objective 5: Spectrum fees for satellite operators should be set in a non-discriminatory manner, to reflect the potential scarcity of spectrum bands and at a level which allows the recovery of the costs incurred for the regulation and management without deterring market entry.*

  We agree with the principle behind this objective. Spectrum is a valuable and scarce resource, however, ensuring that the price is set in a fair and market friendly manner enables startups and small businesses to compete fairly.

  Given the limited 1MHz duplex spectrum requirements for full servicing capabilities, we believe that Sateliot and other LDR systems should certainly contribute their fees according to their bandwidth requirements. However, we also encourage the URCA to consider reserving

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portions of this spectrum for the deployment of LDR MSS systems, as it has been the case in other jurisdictions around the world.

Q3: Do you agree with URCA's preliminary assessment of the current licence regime meeting Objective 1. If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available.

URCA is correct in its assessment that the current licence regime works effectively for many satellite operators under the class licence requiring registration. However, we wish to note that the emerging relationship between terrestrial networks (TN) and non-terrestrial networks (NTN) operators calls for a more collaborative and harmonious licence regime.

The satellite industry is undergoing significant transformation with unprecedented collaboration between terrestrial network providers and non-terrestrial network providers. This collaboration has led to the development of innovative services and enhanced benefits to consumers over the world. For example, partnerships to enable direct-to-device connectivity and 5G NTN IoT services for customers of terrestrial network providers are becoming increasingly common. These advancements highlight the need for a licence framework that facilitate such collaborations for the application stage.

To address this, we propose introducing licence regimes that allow TN and NTN operators to jointly submit a single application for the provision of specific services or the establishment of specific infrastructure related to their collaboration. Such a framework would ensure all necessary information criteria are met during the application stage while simultaneously reducing the bureaucratic burden on both the regulator and the providers. This streamlined process would decrease time to market, enabling end-users to gain faster access to cutting-edge connectivity solutions.

In this joint licence regime, it is essential to define the roles and responsibilities of each party clearly. Specifically, the spectrum should be assigned to the satellite operator, while the terrestrial network operator would hold the licence to provide services directly to end-users. This delineation ensures regulatory clarity while fostering a framework that enables efficient collaboration and service delivery.

Q4: Do you agree with URCA's preliminary assessment of the current licence regime meeting Objective 2? If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available

We agree with the URCA's assessment on the current licences however, we reiterate a need to consider more novel and emerging collaborative relationships between TN and NTN operators.

We must also stress that this collaboration we present is not intended to serve as a new entrant into the mobile market or provide mobile connectivity directly to end-users and is therefore not contradictory to the URCA's *ad hoc* restrictions.

The relationship envisioned by us and our mobile partners is one of last mile connectivity. We operate only as a network provider of wholesale satellite capacity to the mobile sector. Therefore, the connectivity services provided and the end-user relationship between the mobile operator and the consumer do not change. This is a collaborative and mutually beneficial relationship between a satellite and mobile operator.

Q5: Do you agree with URCA's preliminary assessment of the current licence regime meeting Objective 3? If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available.

We agree with the URCA's findings, however, again stress the importance of considering the operating models adopted by new satellite operators. Even when our business and operational models are innovative, at Sateliot we prioritize compliance at national and international level as our

modus operandi. Models in contradiction to the ITU Radio Regulations should be discouraged, particularly for disaster communications where service interruptions or downtime can lead to loss of life.

Satellite technology, as pointed out by URCA, is resilient and capable of providing connectivity during natural disasters and aiding in search and rescue and recovery efforts. However, this is only true of satellite technology which operates in tested and standardised models which do not suffer from or cause harmful interference.

Q6: Do you agree with URCA's proposed way forward on licencing regime to accommodate satellite-based services in The Bahamas? If not, please provide a detailed explanation of your suggestions, including supporting evidence where available.

Should the URCA not deem it necessary to create a new licence process for the joint application by collaborating TN and NTN operators as an alternative, then we support the adoption of a flexible model whereby these novel approaches can be brought before URCA and tested against the existing licencing regime with room for ad hoc adaptations.

We agree with the inclusion of the provision in the "Matters of National Interest" section and commend the URCA for undertaking further discussions on which licensees are best positioned to provide disaster connectivity support. Sateliot is available to the URCA and the government of the Bahamas to assist in these discussions and provide any insight necessary, particularly in matters on network integration and complementarity TN-NTN

Q7: Do you agree with URCA's preliminary views on the expected spectrum demand in low-frequency and high-frequency bands from satellite-based communication services in The Bahamas? Do you have any other comments on the precise bands that should be opened in priority to satellite-based communication services in The Bahamas? Please provide a detailed explanation of your views, including supporting evidence where available

The URCA has correctly identified and laid out relevant frequency bands for the provision of satellite services as well as the demand for sub-3ghz radio spectrum and its applicability to M2M services. Furthermore, the URCA correctly identified the L and S band as important spectrum for the MSS in novel use cases around the world. It is likely that demand for these bands will also increase within the Bahamas.

We therefore recommend incentive structures that promote the most efficient spectrum users to provide services in the Bahamas. As demand for the spectrum increases, and should demand exceed supply, it is in the best interests of the incumbent users, the consumers and the regulator that market entrants are using spectrum in a highly efficient manner. This may be accomplished through innovations at the technical or service level but should be demonstrable to the URCA at time of application.

Our services, based on narrowband technology, require a minimal amount of spectrum for full-service delivery and national coverage. For instance, 1 MHz would suffice for Sateliot to operate in full capacity giving local mobile network operators a competitive edge. Sateliot operates within the S-Band, specifically in the following radio frequencies:

- 1980 - 2010 MHz Uplink
- 2170 - 2200 MHz Downlink

Following 3GPP 5G NB-IoT NTN standard we provide services within these specific bands. These bands are utilised not only by narrowband operators but also by broadband operators. The risk is that regulators might allocate the entire spectrum within these bands solely to broadband operators. This

restricts market entry for new operators coming with new technologies and reduces competition, options and benefits for end-users.

To address this, Sateliot suggests that the URCA allocate a small portion of this spectrum specifically to NB-IoT operators, thereby protecting these smaller operators from potential spectrum monopolisation. More specifically, we suggest the URCA **reserves a 5 MHz block** within the bands mentioned above **for NB-IoT operators to deploy their services in the country**, ensuring nationwide availability for Bahamians while fostering competition. With each operator needing only up to 1 MHz to provide services, this approach could allow up to five different operators to enter the market, ultimately driving down costs for end-users.

Some countries have already recognized the strategic importance of this technology. For example, in the Kingdom of Saudi Arabia, the Communications, Space & Technology Commission (CST) has reserved a 5 MHz block within the specified frequencies to prioritise the deployment of NB-IoT technologies. Similarly, the Australian Communications and Media Authority (ACMA) has allocated 5 MHz exclusively for NB-IoT use. This position illustrates a growing recognition of the importance of a dedicated spectrum for NB-IoT services, underscoring the potential benefits of such an approach in fostering a robust and competitive IoT ecosystem. Since NB-IoT operators require minimal spectrum, a single 5 MHz block can support up to five different operators providing this service maximizing the efficient use of the spectrum.

Q8: Do you agree with URCA's preliminary views on interference risks for satellite-based communication services in The Bahamas? Please provide a detailed explanation of your views, including supporting evidence where available

Acknowledging URCA´s interference risks considerations, Sateliot wishes to provide no further comment to this question.

Q9: Do you agree with URCA's proposed safeguards to prevent any future interference issues? Please provide a detailed explanation of your views, including supporting evidence where available

Sateliot concurs with URCA's proposed safeguards to prevent future interference between satellite-based communication services and other wireless services. The outlined mitigation measures are well-established techniques for ensuring harmonious coexistence among diverse spectrum users.

Additionally, we would like to emphasize the importance of protecting terrestrial services and MSS in adjacent bands, particularly in NTN-TN complementarity models such as D2D. Enforcing out-of-band emission limits can help mitigate potential interference, preserving the integrity of both satellite and terrestrial communications.

Furthermore, we advocate for restricting the use of No. 4.4 filings for commercial applications due to the regulatory and technical challenges they present. Such filings, which allow for operation without international recognition or protection, may lead to coordination difficulties and potential interference issues, undermining the integrity of spectrum management.

Q10: Do you have any comments on the principles et revised structure proposed by URCA for satellite-based electronic communications services in The Bahamas? Please provide a detailed explanation of your views, including supporting evidence where available

We support the URCA's approach to spectrum fees particularly the principles outlined. Principle c) is most welcome to test services and assess commercial viability.

The URCA has set fair spectrum fees, and we support the method applied.

Q11: Do you have any comments on the proposed requirements for satellite service providers conducting the administration and management of their business from premises outside of The Bahamas? Please provide a detailed explanation of your views, including supporting evidence where available

We do not provide services directly to end-users and do not collect data from end-users. Our service is a last-mile connectivity service for mobile network operators which provide IoT services to their customers. Our MNO partners must comply with all lawful interception requirements issued to them as they hold the relationship with the end-user.

Q12: Do you have any comments on other topics related to the provision of satellite-based communication services in The Bahamas which should be considered by URCA? Please provide a detailed explanation of your views, including supporting evidence where available

Considering cross border agreements with neighbouring countries for transitioning/temporary roaming IoT devices.

The primary motivating factor for the use of satellite connected terminals over only terrestrial terminals is the ability to have ubiquitous coverage, especially in remote and border regions of a country. It is of significant benefit to all parties where bilateral and multilateral agreements are established between bordering countries for roaming devices, especially across territorial waters. IoT devices are especially susceptible to cross borders as they operate in shipping, aeronautical and logistics operations. These devices will in standard lawful use likely regularly cross into and out of the Bahamas. Ensuring that end-users may freely enter and exit the Bahamas for temporary roaming with these devices ensures users confidence, wider adoption and a healthy growing satellite IoT market.

Final Remarks

We thank URCA for the opportunity to participate in this important consultation. We truly appreciate the direction Authority is taking towards assessing the applicability of its satellite regulatory framework to new and emerging technologies.

We remain available to support URCA in finalising this framework and are eager to begin the process of providing our services in the Bahamas. We look forward to collaborating further and contributing to the growth and development of the telecommunications landscape in the Bahamas.

Sincerely,

Elisabet Fonalleras
Head of Regulatory Affairs
Satelio IoT Services, S.L.