CONSULTATION
ON
LICENSING OF SATELLITE SERVICES

INITIAL RESPONSES

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CABLE AND WIRELESS

Response to TCI Telecommunications Commission

Public Notice 2025 – 2

Consultation Framework

for the

Licensing of Satellite-Based Internet Service Provider

1. INTRODUCTION

1.1 Cable and Wireless (TCI) Limited dba Flow is pleased to provide comments and remarks on The Commission's **Public Notice 2025 – 2 Consultation Framework for the Licensing of Satellite-Based Internet Service Provider** (the Consultation Document) published March 27, 2025.

1.2 Flow expressly states that failure to address any issue raised in the Consultation Document does not necessarily signify its agreement in whole or in part with any position taken by the Commission or respondents. Flow reserves the right to comment on any issue raised in the Consultation Document at a later date.

1.3 All quotations in Flow's Response are from the Consultation Document, unless otherwise stated, and the paragraph number or page number will be cited for reference.

1.4 Please send all responses to this Consultation Document and any matters arising to Joanne Missick at joanne.missick@cwc.com and Melesia Sutherland at melesia.sutherland@cwc.com .

2. Flow's Response to Commission's Questions

Question 1: Should the Commission introduce a new licence type to facilitate the specific licensing of satellite-based internet services?

2.1 Flow does not support the introduction of a new licence type for satellite-based internet services. Licenses should be technology neutral, that is indifferent to the technology used to provide a service. This aligns with the Commission's functions under Section 4 of the Telecommunications Ordinance which requires the Commission:

…….

(*c) to regulate telecommunications in the Islands in accordance with the policy guidelines published in the Gazette from time to time and in accordance with the* ***principle of technological neutrality***[1]*;*

(**emphasis added**).

2.2 Technology Neutrality is reinforced by the definition of *'Internet Network or Services licence' which is defined as: "A network or service that provides users the ability to access the internet,"* and the Commission's interpretation that this definition '*could be considered to include satellite-based internet connectivity, as this definition does not include any restrictions on how the service must be delivered. Therefore, the Commission believes that this type of licence could be a potential placement for satellite-based internet services as it fits the Internet Network or Services description for the service that is being provisioned'*[2]

2.3 Technology neutrality allows providers who own infrastructure and provide services over that infrastructure to offer a range of services on the same terms and conditions, that is there are the same legal obligations for the same service. And network operators/ service providers are not restricted to using specific technology or equipment configuration in the provision of services to customers but have the flexibility to deploy the technology that would provide the most efficient and affordable service.

2.4 The Commission's takes the position that:

'..*the Commission believes that it would be beneficial to be able to differentiate between terrestrial and satellite-based provision in these types of licence awarded to service providers, so that any specific licence provisions that may apply could more easily be tailored to the services involved to form a distinction between terrestrial and satellite-based licensees*[3]' because it is not supported by the technology neutral provision of the Ordinance or definition of Licence type and does not promote a level playing field for all providers offering the same or similar services. Accordingly, Flow does not agree with the introduction of a new license type to facilitate satellite-based internet services. The existing Licence types are adequate, are consistent with the Ordinancet, and assure a level playing field for all providers of the same service, regardless of the technology used.

2.5 In its Consultation ICT 2024-2, Consultation Framework for the Licensing of Satellite-Based Telecommunications Providers, the Cayman Regulator, Ofreg, asserts that:

31. All ICT licensees are subject to these requirements. There are no regulatory reasons that any company that wishes to supply retail internet or voice services in competition with (or in conjunction with) existing providers should not be licensed on a similar basis. Not requiring the same from a

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[1] Para. 10(c)
[2] Para 13
[3] Para 15

satellite-based provider would potentially put them at an unfair advantage compared with terrestrial providers and The Office is bound to ensure that competition between providers is fair.

2.6 There is precedence in the Caribbean for issuing licences to Starlink in existing license categories:

(i) In Trinidad and Tobago, Starlink was issued a '*Type 2 Concession for the Provision of a Public Domestic Fixed (via satellite) Telecommunications Network and Public Domestic Fixed Telecommunications Services on a National Geographic Scale'* which is within the existing category of licences. A Type 2 Concession is a Network-Service Concession (network-based) which authorises a concessionaire to own or operate a public telecommunications network in addition to providing public telecommunications services over that network.

(ii) In Jamaica, Starlink was issued a Carrier Licence and a Service Provider Licence, again within the existing licence category. A Carrier Licence because it owns and operates a public telecommunications infrastructure and the Service Provider Licence that allows Starlink to offer services.

Question 2: What approach should the Commission take to establish the licence fees for satellite-based internet services?

2.7 Use of existing licence categories facilitate competition and are technology neutral. A technology neutral approach is consistent in the treatment of all service providers of the same/similar services and virtually eliminates arbitrage between different licence types for the same services. As such Flow agrees with the Commission's proposal at paragraph 22 to: '*Use existing Internet Network or Service licence categories and their corresponding rates and apply them to the satellite internet services*;..'

Question 3: In what way should the Commission approach the issues associated with the fact that the provision of some parts of a satellite service occur outside its jurisdiction?

2.8 The Commission's conclusion that:

21. As such, existing satellite networks are regulated outside the Commission's jurisdiction. The only part of the satellite service that would be directly regulated by the Commission is those situated in the Turks and Caicos Islands. This constitutes only the satellite terminals used by end-users to connect to the satellite service…'

does not adequately reflect reality. It is not satellite terminals that are regulated but rather the service provided. Satellite providers would be licensed to offer a service of which the Customer Premises Equipment (CPE), in this case, satellite terminals, provide access. The provision of that service is what is governed by any Licence issued. We do not see the provision of telecommunications services via satellite as dissimilar to telecommunications services offered by existing providers in the Turks & Caicos Islands (TCI) via terrestrial infrastructure. Some parts of terrestrial service, particularly where destined for termination outside of TCI, is outside of the Commission's jurisdiction. Flow does not believe that this has impaired the Commission's ability to regulate the operators licensed to offer services in TCI.

2.9 Flow supports the Commission's own solution to its defined limitations:

30. There are several ways in which the Commission could approach these issues, for example:

- *Include the necessary provisions in the licences of any satellite services, with a requirement to make best efforts to ensure that they are met.*
- *Recognize that there are certain issues which will fall outside the jurisdiction of the Commission and exclude the requirement from the obligations from the licence of any satellite-based provider.*

2.10 Flow's further comment on this matter is that with technology neutrality, '*best effort*' proposed to be applied to satellite licenses must also be applied to terrestrial licenses.

Question 4: How should the Commission proceed with the requirements for Islander Control for satellite internet services?

2.11 Flow is satisfied that the Telecommunications Ordinance addresses this question.

Question 5: What approach should the Commission take to the licensing of VSAT terminals?

2.12 Flow's view is that a technology neutral approach should be taken by the Office.

Where it is that VSATs are intended for use by residential customers for personal use, similar to the personal use of mobile phones, Flow's view is that is that consistent with technology neutrality, authorization should be included in the licence of the satellite service provider. As with mobile phones, the satellite provider, not the customer, must pay for the VSAT spectrum used.

Question 6: Do you have any comments on the Commission's assessment of the potential interference between satellite terminals and other services?

2.13 Flow shares the Commission's concerns about the potential for interference between VSAT transmission and point to point microwave links. This is perhaps a greater risk for TCI because the Family Islands are connected by microwave links. The Commission is right to take a posture of vigilance to protect existing services to the Islands from interference by VSAT transmissions. This is in line with the international radio regulation principle to protect existing services.

2.14 The Commission must ensure that satellite providers present robust and tested means to mitigate interference, which is agreed by existing terrestrial operators as sufficient to mitigate interference.

2.15 The Commission must also have means of recourse to address interference.

Question 7: What are your views on the extent to which the introduction of satellite-based services will impact the businesses of existing suppliers and affect consumers?

2.16 The Commission asserts at Paragraph 44 that:

44. Whilst satellite-based internet providers therefore offer competition to local services, we do not believe that at current price levels they would be taken up by a large enough number of subscribers to damage the ability of existing operators to continue to invest in their networks, or reduce their quality of service to a detrimental level which will materially impact the service they provide to consumers.

2.17 Flow has been issued a fifteen (15) year licence. Flow would expect that a fifteen (15) year licence will be issued to satellite providers. Given the relatively long licence term, the statement the Commission has made is valid only in the short term.

2.18 An understanding of the satellite business model is key to assessing the impact on existing suppliers and customers. Specifically, the business model of Low Earth Orbit (LEO) satellite providers, which are offering or seeking to offer services directly to consumers, businesses and governments. LEOs embrace the business model made popular by the likes of Amazon, Facebook and Uber, where rather than aiming for immediate positive cash flow, the focus is on acquisition of customers and the control of ecosystems, through low initial prices to attract business, and subsidies, even if that eliminates the possibility of profits for a while. Their goal is to become the early leader, and once a critical mass of users is established and scale created, then focus is shifted to generating revenues from the network[4].

2.19 LEO (Low Earth Orbit) providers like SpaceX (Starlink) and Amazon (Kuiper) can forgo profitability for relatively extended periods of time because of massive private capital investment, including from venture capital, private equity, and investment from tech giants. SpaceX has raised billions from investors such as Google and Fidelity, enabling rapid scaling of Starlink without immediate need for capital injection from subscribers. Their investors are willing to wait longer for profits from these large LEO constellations, with the expectation that these satellite companies will capture the market for telecommunications service and in the future return handsome profits.

2.20 LEO satellites, in particular, are a part of a connected business ecosystems meant to deliver adjacent strategic benefits. For example, by providing high-speed internet connectivity, SpaceX's Starlink could enable SpaceX Tesla connected cars and advance the development of use cases such as autonomous vehicles. Similarly, Amazon's Project Kuiper could enable several services provided by Amazon, including further growth in the global e-commerce market and Amazon Web Services (AWS).

2.21 Even in more advanced economies, LEOs satellites now support low-latency applications and

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[4] Large LEO satellite constellations: Will it be different this time? | McKinsey

high-throughput connections, threatening terrestrial operators in those markets.

2.22 Satellite networks are global networks in that once fully launched, the service can be accessed from anywhere in the world. No terrestrial network is truly global. Regarding scale and reach, Starlink alone has launched over 5,000 satellites as of 2024 and plans to increase that number significantly. Amazon's Project Kuiper aims to deploy over 3,200 satellites. OneWeb has plans to establish a network of approximately 648 satellites, with many already in orbit. These satellites aim to provide global broadband connectivity and will, in time, provide mobile services, directly**.** The only impediment, currently, to provide mobile services is the allocation of spectrum to satellite service at the global level, to do so.

2.23 Another aspect of the scale of LEO constellation is the massive scale of their principals. The GDP of TCI is relatively small compared to the revenues of major tech companies who own or control LEO constellations. The GDP for TCI in 2024 was USD$1.40 billion[5]. In comparison, companies like Apple, Amazon, and Alphabet each generate annual revenues in 2024, two hundred (200) times greater than the GDP of TCI[6]. The larger operators in the Caribbean, Cable & Wireless and Digicel, generate revenues in the hundreds of millions to low billions, with heavy investment costs in infrastructure.

2.24 The outsize economic power of satellite-based telecommunications providers, like LEO satellite constellation and their investment consortiums has enormous implications for competition and regulation in TCI. It means that Pan Caribbean operators, and local operators, are in a weak position compared to global LEO satellite consortium, funded by private equity, powerful tech companies, and

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[5] https://tcweeklynews.com/tcis-gdp-projected-to-grow-by-in-p14006-155.htm?utm_source=chatgpt.com

[6] https://stockanalysis.com/stocks/aapl/revenue/?utm_source=chatgpt.com; https://stockanalysis.com/stocks/amzn/revenue/?utm_source=chatgpt.com

invested governments. Therefore, there is no doubt that satellite providers will have an enormous impact on existing service providers. The Commission must devise regulations that account for the power of satellite consortiums, which is further evidenced by the fact that for World Radio Conference (WRC) 2027, 80% of the agenda is occupied by satellite matters. The WRC allocates spectrum for new services and promotes international harmonization of the use of spectrum.

2.25 Flow recommends that the Commission license satellite services within the existing licence framework consistent with the Ordinance.

3. Conclusion

3.1 Flow makes the following recommendations to the Commission, in response to its questions:

i. **Promote competition**: The business model of satellite-based telecommunications providers, funded by private equity, powerful tech companies, and invested governments coupled with satellite operators' global economies of scale could enable pricing below local market sustainability levels, creating an unfair competitive advantage for satellite providers and driving terrestrial providers out of business. A return to monopoly is to be avoided. Monopoly could result in unfettered price increases for TCI Islanders.

ii. **Promote competition**: where satellite-based telecommunications providers offer the same or similar service to terrestrial providers, and, or use, the same spectrum bands, they should be licensed within the same licensing regime as terrestrial providers and be subject to all the terms and conditions, taxes, and regulatory payments as existing terrestrial providers. It is well worth noting that in recent times, Starlink has announced that it has successfully implemented Direct-to-Device service, in partnership with T-Mobile, which means that Starlink's satellites can provide services directly to a mobile phone, without any need for modification of the mobile phone, just as a mobile operator can. The only missing piece is the allocation of spectrum to satellite-based telecommunications providers so that they can provide mobile services directly to customers, without the need to partner with a terrestrial operator.

iii. **Promote employment**: With the intense competition from global tech companies, like satellite-based telecommunications providers, terrestrial providers may have to shed jobs to meet the competition. In the same way that terrestrial providers created jobs, for TCI Islanders, that power the local economy, satellite-based telecommunications providers must be required to create jobs in TCI and contribute directly to the growth of its people and economy. The Commission should not encourage jobless innovation. Satellite providers should be encouraged to establish ground infrastructure within TCI, contributing to the local economy.

iv. **Protect existing services and existing spectrum assignments from interference from satellite-based telecommunications providers**: The Commission must ensure that satellite providers present robust and tested means to mitigate interference, which is agreed by existing terrestrial operators as sufficient to mitigate interference.

v. **Protect Customers**: the challenge that small island states could face when dealing with global tech companies, like satellite-based telecommunications providers, is that their small population and footprint may cause them to be overlooked. TCI is attractive to satellite-based telecommunications providers because of its high GDP, its vibrant tourism industry, and affluent population. None of these factors suggest that these providers are seeking to bridge an identified digital divide or provide disaster relief, which although achievable, and popular arguments by satellite-based telecommunications providers, are not the drivers for entry. Licence conditions to support customers in TCI must be consistent with those for terrestrial providers of similar/ same services.

3.2 Flow's recommendations aligns with the Commission's functions under Section 4 of the Telecommunications Ordinance which requires the Commission:

…….

(*c) to regulate telecommunications in the Islands in accordance with the policy guidelines published in the Gazette from time to time and in accordance with the* ***principle of technological neutrality****;* (**emphasis added**)

(d) to facilitate, maintain and promote effective and sustainable competition in telecommunications.

……..

(f) to promote the interests of consumers and to encourage licensees to operate efficiently;

……..

(j) to prescribe standards for the protection of consumers and the public;

……..

END

April 25, 2025

Mr. Kenva Williams
Director General
Turks & Caicos Islands Telecommunications Commission
P.O Box 203, Business Solutions Complex
Leeward Highway, Providenciales
Turks & Caicos Islands

Dear Mr. Williams,

RE: Digicel Response to the Public Consultation by the Turks and Caicos Islands Telecommunications Commission on Consultation Framework for the Licensing of Satellite-Based Internet Service Providers

The matter at caption refers.

First, Digicel (TCI) Ltd (trading as Digicel) thanks the Turks and Caicos Islands Telecommunications Commission for the opportunity to provide our comments on the consultation document "Consultation Framework for the Licensing of Satellite-Based Internet Service Providers" dated 27th March 2025 (the "Consultation").

Digicel now respectfully submits its comments and responses to the Consultation. The comments as provided herein are not exhaustive and Digicel's decision not to respond to any particular issue(s) raised in the draft Regulations or any particular issue(s) raised by any party relating to the subject matter generally does not necessarily represent agreement, in whole or in part nor does any position taken by Digicel in this document represent a waiver or concession of any sort of Digicel's rights in any way.

Please do not hesitate to refer any questions or remarks that may arise as a result of these comments by Digicel to Marlon Albarico, CFO, Digicel TCI (email: marlon.albarico@digicelgroup.com) and Sharian Hanson, Legal and Regulatory Director (Regional), Digicel Group (email: sharian.hanson@digicelgroup.com) in copy.

Yours sincerely

……………….
Marlon Albarico
CFO
Digicel TCI

CC: Meredith Sharples, Regional North Atlantic CEO, Digicel

Question 1: Should the Commission introduce a new licence type to facilitate the specific licensing of satellite-based internet services?

Response:

The proposal to introduce a new licence type specifically for satellite-based internet services is wholly unwarranted and fundamentally unsound from a regulatory, commercial, and public policy standpoint. We respectfully but firmly oppose such a measure for the reasons outlined below.

1. It undermines Regulatory Neutrality and Competitive Equity

The cornerstone of a credible regulatory framework is technology-neutral licensing and competitive parity. Introducing a new licence category tailored for satellite-based operators risks creating an uneven playing field by offering regulatory carve-outs or reduced obligations to market entrants who have not invested in national infrastructure or long-term spectrum assets.

Mobile operators have operated under clear, established licensing regimes for decades. We have and continue to invest in nationwide coverage, comply with universal service mandates, pay significant fees, contribute to public safety systems, and operate within a regime of comprehensive regulatory scrutiny. Any move to afford satellite providers lighter-touch or differently structured obligations through a new licence class would severely compromise regulatory fairness and distort market outcomes.

2. It devalues Legacy Investments and introduces possible Regulatory Arbitrage

Mobile operators have collectively invested billions in terrestrial infrastructure, spectrum acquisition and service obligations premised on the understanding that all providers would be subject to comparable legal and regulatory frameworks. A sudden shift to introduce a new, parallel licensing regime tailored to a specific technology segment — particularly one predominantly operated by foreign-based entities — is tantamount to devaluing those sunk investments.

Moreover, this approach opens the door to regulatory arbitrage, where new entrants can possibly select licence types not based on service alignment or consumer need, but based on where regulatory burdens are lowest. Such a precedent is dangerous and unsustainable.

3. Existing Licence Categories are adequate

There is no demonstrated gap in the current licensing framework that would require the creation of a new satellite-specific licence. Satellite operators can already be accommodated under existing authorisations and the Commission has not provided a detailed justification for the creation of a new licence category, nor has it outlined the regulatory jeopardy that will ensue if existing licence categories are used. The appropriate regulatory response is not to create new categories of licences but to ensure that all providers, regardless of technology, are held to the same standards and obligations and that compliance is robustly monitored in relation to all licensees.

5. This proposal signals Regulatory Inconsistency

The introduction of a new licence class, seemingly as a reactive measure to accommodate recent market entrants, would raise serious concerns about the predictability, stability, and objectivity of the regulatory environment. Mobile operators plan over multi-year investment cycles. Shifting the rules arbitrarily and without justifiable reason to facilitate one segment at the expense of another sends a damaging signal to the investor community — both domestic and international.

In conclusion, the creation of a new licence type for satellite internet services is neither necessary nor advisable. It threatens regulatory neutrality, undermines infrastructure-based competition, and introduces unacceptable risk to long-term market stability. We urge the Commission to maintain a principled approach to licensing: one that is technology-neutral, equitable, and consistent. If satellite providers wish to operate in the market, they should do so under the same obligations, scrutiny, and frameworks as all other licensed operators.

The Commission is further asked to note that there is precedent within the region of satellite providers being issued licences within existing licence categories such as in Trinidad and Tobago and Jamaica.

Question 2: What approach should the Commission take to establish the licence fees for satellite-based internet services?

Response: Digicel is in support of using existing Internet Network or Service licence categories and their corresponding rates and apply them to satellite internet services.

As a mobile operator with significant long-term investments in the national telecommunications infrastructure of the TCI, we urge the Commission to adopt a strict parity-based approach when determining the licensing fees applicable to satellite-based internet services. Any deviation from this principle would result in an uneven playing field, reward infrastructure-light entrants, and disincentivize further national investment in telecommunications.

The principle of technology neutrality requires that functionally equivalent services be treated equivalently under the law. Satellite-based internet services deliver broadband connectivity to end users and compete directly with mobile broadband, fixed wireless, and fibre-based offerings. It follows that their licensing regime, including fee structures, must reflect this reality. To apply a materially lower licence fees to satellite operators on the basis of delivery method alone would constitute regulatory discrimination.

Mobile operators have, for years, borne the costs of spectrum licence fees (often awarded via auction or at high fixed costs), cell tower deployment, network buildout, numbering fees and other costs associated with regulatory compliance, and public safety mandates. Mobile operators also contribute significantly to national objectives — from universal access and emergency services to digital inclusion and lawful interception, as well as provide local employment and skill development. Satellite providers cannot be permitted to avoid financial obligations under the guise of being "innovative" or "alternative" service providers. If they are accessing the same customer base and delivering the same class of service, they must pay the same regulatory fees.

A level playing field also means licences that contain the relevant protections against anti-competitive behaviour such as regulation of significant market power, as encapsulated in existing telecommunication network and spectrum licence documentation. In other words, there is no discriminatory action/requirement prevalent in the market (i.e., all market participants situated in the same market are treated similarly). This is to prevent a scenario where satellite service providers are not held to the same regulatory/competitive conditions as terrestrial operators and which we are currently witnessing with OTT providers.

Digicel opines that any and all satellite telecommunications service providers must declare revenues earned in the TCI jurisdiction and pay the requisite regulatory fees/levies/taxes as at when due. As such, Digicel seeks clarification on how the TCITC seeks to enforce Clause 20.

Digicel therefore respectfully submits that the Commission should use existing Internet Network or Service licence categories and their corresponding rates and apply them to the satellite internet services.

Question 3: In what way should the Commission approach the issues associated with the fact that the provision of some parts of a satellite service occur outside its jurisdiction?

Response:

Digicel strongly urges the Commission to take a proactive, firm, and jurisdictionally assertive approach in regulating satellite-based internet services, particularly where elements of service provision originate or are controlled from outside the TCI. The extraterritorial nature of satellite operations must not be used as a shield to avoid regulatory compliance, undermine local obligations, or bypass the enforcement authority of the Commission. Further, Digicel respectfully disagrees with the Commission's statements on its perceived limitations on the regulation of satellite services (i.e. paragraph 26).

It is immaterial where the satellite is launched, where the ground control is located, or where the core network functions reside. If the service "terminates" or is offered in the TCI, and serves end users here, it must be fully subject to national laws, regulations, licensing, taxation, and enforcement. Mobile operators are subject to strict regulatory obligations for every service offered within national borders, including spectrum use, quality of service, consumer protection, security, and universal access. There can be no regulatory exception for satellite providers simply because some aspects of their technical infrastructure are located overseas. The Commission must assert full jurisdictional authority over any entity providing services into the country, regardless of where that service originates. This is consistent with international regulatory norms and established principles of territorial jurisdiction over services delivered to citizens.

Satellite operators often structure their operations to exploit gaps in national regulatory frameworks, for example, by locating call centres, customer databases, or billing systems offshore. This type of jurisdictional arbitrage strategy must be pre-emptively and explicitly addressed, failing which the people of the TCI will pay the ultimate price.

The Commission must require local licensing of all service providers delivering internet access to local consumers, irrespective of delivery platform. It must also mandate local legal representation and compliance contacts for enforcement and accountability. Matters of public safety, data protection, data sovereignty, lawful intercept compliance, and network resilience are far too critical to go unregulated.

Further, Digicel holds the view that the TCITC should enforce a strict policy where the potential satellite telecommunications service providers furnish the Commission with a quarterly report on the number of satellite equipment brought into the country and in use for the provision of satellite telecommunication services to end-users

Secondly, Digicel seeks clarity on the assertion in Clause 24. Does this statement indicate and/or imply that Satellite Operators will not face the same network infrastructure regulatory obligations currently faced by terrestrial Operators (i.e., infrastructure sharing obligations, interconnection etc.)?

Such a position goes against the grain of telecommunication regulation when treating with principles of non-discrimination and reciprocity for operators (terrestrial and non-terrestrial) in similarly situated markets.

Digicel's position is that there should be fair and non-discriminatory application of the extant telecommunication legislation/ regulations to new entrants (satellite broadband providers) and incumbents alike.

Question 4: How should the Commission proceed with the requirements for Islander Control for satellite internet services?

Response:

Presently a licence cannot be obtained without fulfilling the requirements for Islander Control. Where exemptions are granted, this may be on the basis that the licensee in question invests in local towers, fibre, spectrum, and retail infrastructure, employs local staff, pays local taxes, licence fees, participates in public safety systems, emergency alerts, and disaster recovery and submits to full local regulatory oversight and consumer protection obligations. As such, where exemptions or accommodations have been made, these have been justified and earned through tangible national contributions.

Mobile operators have earned any exemptions or dispensations through sustained local investment, employment, and compliance, whereas satellite service providers, many of whom are foreign-owned, asset-light, and operate outside of traditional regulatory boundaries, must not be granted exemptions from Islander Control obligations. To grant an exemption to satellite providers who may have no local presence, negligible domestic employment, and no physical infrastructure on-island would directly undermine the principle of non-discrimination in the application of telecommunication legislation/regulation on operators in similarly situated markets in the Turks and Caicos Islands.

As such, the Commission must uphold Islander Control requirements for all service providers delivering telecommunications or internet services to end users in the TCI. This includes satellite operators. If exemptions are granted at all, they must be based on equivalent local investment, employment, and policy alignment — not on foreign business models or infrastructure configurations designed to operate beyond the reach of national regulation.

We therefore call on the Commission to:

- Reject any proposal to exempt satellite providers from Islander Control requirements

- Require that all operators demonstrate meaningful local ownership or obtain a formal exemption based on clear and enforceable criteria
- Ensure a level playing field for all participants in the national telecommunications market

Question 5: What approach should the Commission take to the licensing of VSAT terminals?

Response: The Commission should ensure that VSAT terminals operate within parameters that are not deleterious to any other operator (terrestrial or otherwise). These include defined spectrum ranges as per the regulations, radiated power classifications and specifications. Digicel supports maintaining the current arrangement in which each terminal would require an VSAT licence application with the associated fees.

Question 6: Do you have any comments on the Commission's assessment of the potential interference between satellite terminals and other services?

Response:

We strongly agree with the Commission's assessment that the potential for harmful interference between VSAT terminals and other terrestrial services particularly fixed point-to-point microwave links is real and must be proactively managed through a robust and enforceable regulatory framework.

As mobile operators, we rely heavily on fixed microwave point-to-point links in the 12.75–13.25 GHz band to interconnect base stations and extend coverage across the TCI. These links are foundational to the delivery of reliable mobile and broadband services. Any degradation of this infrastructure through radio interference particularly from unregulated or poorly managed VSAT terminals poses an unacceptable risk to national telecommunications resilience and service quality. The Commission's recognition of potential interference is itself the strongest argument in favour of maintaining mandatory licensing for all VSAT terminals.

Given the shared use of spectrum, we recommend that any proposed VSAT deployment be subject to coordination with existing terrestrial licensees, including mobile operators using point-to-point microwave links. This coordination should include:

- Notification of proposed installations
- Geographical and frequency compatibility assessments
- Technical compliance with antenna alignment and power limits

We further recommend that the Commission require site-specific authorizations for VSAT terminals operating in shared bands, at least until a reliable interference-free record is established. We urge the Commission to invest in spectrum monitoring capabilities and publish procedures for addressing interference complaints, including escalation pathways and resolution timelines.

Question 7: What are your views on the extent to which the introduction of satellite-based services will impact the businesses of existing suppliers and affect consumers?

Response:

The introduction of satellite-based internet services into the TCI will have significant implications for both existing telecommunications providers and consumers. While technological advancement and innovation are welcome, it is imperative that such services are introduced in a manner that preserves fair competition, safeguards national investment, and protects consumers from fragmented or unregulated service environments.

The following should be noted:

1. Disruption without a level playing field will undermine existing suppliers:

Mobile and fixed broadband operators have made substantial long-term investments in:
- Spectrum acquisition and licence fees
- National network infrastructure (towers, fibre, microwave backhaul)
- Universal service obligations and public safety infrastructure
- Local employment, retail, and customer support networks

If satellite-based services are allowed to enter the market without equivalent licensing, regulatory obligations, or financial contributions, this would represent a serious distortion of competition. It would effectively reward offshore or asset-light providers while penalizing those who have built and sustained the national communications infrastructure.

This form of regulatory asymmetry would not only destabilize current operators' business models, but also disincentivize future investment in infrastructure upgrades, rural expansion, and service quality improvements.

2. Satellite Services may fragment the Consumer Experience

While satellite internet may offer basic connectivity in remote areas, it poses several challenges from a consumer perspective:

- Higher latency compared to terrestrial networks, impacting real-time applications like video conferencing, gaming, and VoIP
- Unclear consumer protections, particularly where the provider lacks a local presence or licensing
- Lack of integration with national emergency services, early warning systems, or lawful intercept frameworks
- Potentially higher prices, particularly where foreign currency billing or dynamic pricing models are used

Without strict local licensing and enforcement, consumers may be exposed to lower service quality, limited recourse for complaints, and reduced transparency around data usage, throttling, and contract terms.

3. Market Entry must be fair, structured, and fully regulated

We do not oppose the introduction of satellite services per se, but we insist that their entry be governed by:

- Full licensing with equivalent financial and regulatory obligations
- Enforceable consumer protection standards
- Participation in national infrastructure obligations (e.g. infrastructure sharing/access emergency services)
- Transparency in pricing, data usage policies, and customer service standards

Without these, the impact on existing operators will be harmful, and the benefits to consumers will be unreliable and potentially short-lived.

We urge the Commission to adopt a cautious, structured, and enforcement-led approach that ensures satellite providers are held to the same standards as terrestrial operators. The long-term health of the sector, and the interests of the people of the TCI, demand nothing less.

We wish to also state the following:

- Any and all satellite telecommunication services provider must apply and be granted a licence for spectrum. This premised on the fact that a satellite service base station/CPE also transmits a signal to the satellite.
- Any and all satellite telecommunications service provider must furnish the Commission with a quarterly report on the number of satellite equipment brought into the country and in use for the provision of satellite telecommunication services

to of satellite telecommunication services to end-users. This position should be adopted after the relevant service provider has applied and obtained a network license to operate within the TCI jurisdiction. In layman terms, such satellite telecommunication service providers must apply for and obtain a telecommunications network licence to provision their services in the Turks and Caicos Islands (TCI).

- Any and all satellite telecommunication service providers may be required to block/throttle devices being used to access their satellite services within the jurisdiction of the TCI until said end-user registers as a TCI customer for the period when they are situated in the TCI (I.e., if a customer is passing through/or situated for a short period in the TCI this is captured and the pre-requisite fees apportioned accordingly for that period by the satellite telecommunication service provider). The aforementioned is easily achievable via the utilization of location-based technology. Hence, the Commission can decipher and delineate between devices (I.e., CPE's) accessing accessing satellite services situated in the TCI and transient devices situated in the TCI for a limited period of time
- Any and all satellite telecommunications service providers must declare revenues earned in the TCI jurisdiction and pay the requisite regulatory fees/levies/taxes as at when due. It is pertinent to note that GPS technology virtually guarantees Any device registered, whether fixed or mobile, that is located within the jurisdiction of the TCI for more than a specified/stipulated number of days (I.e., 5, 10, 15, 20 business days) is considered fixed in TCI for the billing period and the revenue must be declared
- The TCITC should ensure that all players are operating on a level playing field. A level playing field where operators participating in the same market are subject to the same competitive conditions (i.e., regulatory obligations such as USF fees, Regulatory Fees, Dominance (SMP), Licensee obligations to Users, Non-discrimination, Force Majeure and Service Interruption to mention a few) as encapsulated in existing telecommunication network and spectrum licence documentation. In other words, there is no discriminatory action/requirement prevalent in the market (i.e., all market participants situated in the same market are treated similarly).

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25 April 2025

Mr. Kenva Williams
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GSOA Response to the "Consultation Framework for the Licensing of Satellite-Based Internet Service Providers"

I. Introduction

GSOA[1] thanks the Turks and Caicos Islands Telecommunications Commission (Commission) for the opportunity to comment on the Consultation Framework for the Licensing of Satellite-Based Internet Service Providers (Framework). GSOA commends the Commission for its recognition of the benefits satellite connectivity can bring to residents and visitors in the Turks and Caicos Islands and its commitment to facilitating satellite connectivity through the establishment of a regulatory framework for satellite operations. GSOA and its members look forward to working with the Commission in developing this Framework.

GSOA generally supports the establishment of a regulatory framework for satellite operations in the Turks and Caicos Islands and advocates for the development of an enabling framework to facilitate operator entry, increased consumer choice, and affordability. GSOA provides below specific feedback on questions posed by the Commission.

II. Comments on the Framework

Question 1: Should the Commission introduce a new licence type to facilitate the specific licensing of satellite-based internet services?

GSOA commends the Commission for recognizing the value satellite connectivity brings to consumers in the Turks and Caicos Islands and encourages the Commission to develop a regulatory framework that facilitates the deployment of geostationary satellite orbit (GSO) and non-geostationary satellite orbit

[1] GSOA provides a platform for collaboration between companies involved in the satellite ecosystem globally and serves as a unified voice for the sector. Our vision is to help policymakers improve the state of the world by continuously bridging digital, educational, health, social, gender, and economic divides across diverse geographies and economies. As a global non-profit association, GSOA serves as a representative body for the satellite industry and engages with regulators, policymakers, and international organizations.

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(NGSO) fixed-satellite service (FSS) satellite systems. Both the existing license types or a new license category such as an Internet Network or Services license may be successfully implemented to license satellite internet services so long as the Commission implements best practices in developing these licensing frameworks.

GSOA encourages the Commission to adopt a flexible framework to enable satellite operators to efficiently and effectively provide broadband internet connectivity services in the Turks and Caicos Islands. In establishing such a framework, GSOA specifically encourages the Commission to adopt simplified registration requirements, minimal local entity and/or foreign ownership restrictions, and blanket licensing and homologation of consumer terminals. Under this approach, the Commission could license the provision of retail services to end-users within its territory. In this respect, the foreign satellite operator itself would not need a service license but would have to work through a locally licensed entity or reseller. This would avoid overreach while ensuring regulatory accountability.

In establishing such a framework, the Commission is encouraged to clearly differentiate between satellite operators that provide wholesale satellite capacity and entities that offer internet services directly to end-users. Satellite operators that are not retail service providers should not be subject to retail licensing requirements because the authorization of their space stations is done by the satellite operator's home licensing administration and coordinated at the ITU level, and appropriate local requirements will remain the responsibility of the local licensee contracting the satellite capacity. This distinction avoids duplicative regulation and ensures accountability remains with the locally licensed internet service provider or reseller operating in the territory. A well-defined role division will streamline regulatory oversight while preserving end-user protection and service quality.

Further, GSOA urges the Commission to implement an "open skies" regime to ensure non-discriminatory access for both domestic and non-domestic operators.[2] . These mechanisms can help streamline the ability of users to access satellite connectivity and minimize the administrative and regulatory burdens for both regulators and satellite operators.

Question 2: What approach should the Commission take to establish the license fees for satellite-based internet services?

High regulatory fees associated with satellite operations will significantly increase the cost of operations in the Turks and Caicos Islands, potentially decreasing affordability and discouraging deployment, thereby closing off the benefits of satellite offerings to end users in the Turks and Caicos Islands. It is important to consider that affordable fees make it possible for new entrants, especially small operators or regional satellite providers to provide satellite offerings to customers in the Turks and Caicos Islands, particularly in

[2] *See* GSOA, *GSOA Comments on the UCC Framework for Satellite Communications-2021, Uganda Communications Commission* at 3, https://gsoasatellite.com/wp-content/uploads/2022-01-28-GSOA-Contribution-UCC-Framework-for-Satcom.pdf (noting that "open skies" regimes allow satellite operators to provide capacity internationally without seeking landing rights).

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unserved and underserved communities. To avoid hampering investment by the satellite industry, GSOA respectfully recommends that the Commission establish a fee structure for satellite licenses, including spectrum access and earth station licenses, that is based on a cost-recovery model that is intended to recover the costs of carrying out the Commission's licensing functions. A cost-recovery model will encourage the continued deployment of innovative connectivity options in the Turks and Caicos Islands, increasing competition and maximizing the affordability of satellite broadband offerings for customers.

GSOA further encourages the Commission to align its fee structure with similar jurisdictions in the region to ensure regulatory continuity and facilitate deployment. The combination of the Turks and Caicos Islands' four proposed fees (Application Fee, Initial Fee, Renewal of Licence Fee, and Annual Regulatory Fee) and required consumer terminal fees are considerably burdensome as compared to the declining fees of other countries in the region. For instance, in Panama, the National Authority for Public Services recently reduced its spectrum license fees by 75% to further facilitate the deployment of high-performance satellite systems and close the digital divide.[3] Similarly, in a 2024 public consultation, the Utilities Regulation and Competition Authority of the Bahamas proposed a reduced spectrum fee for earth stations in motion (ESIM) and FSS licensees of $0.70 per MHz.[4] The adoption of disproportionately higher fees as proposed by the Commission could slow deployment, reduce competition, and decrease the affordability of satellite broadband services for consumers in the Turks and Caicos Islands. Accordingly, GSOA respectfully urges the Commission to foster the deployment of FSS networks and systems within the Turks and Caicos Islands by aligning its fee structure with other similar jurisdictions in the region.

Question 3: In what way should the Commission approach the issues associated with the fact that the provision of some parts of a satellite service occur outside its jurisdiction?

GSOA encourages the Commission to consider that satellite operators and service providers are typically able to meet domestic lawful intercept obligations and maintain the protection and security of network traffic without locating the data in a given jurisdiction. Requiring local operations does not appropriately reflect the modern network capabilities of existing and future satellite systems and will result in significant operational costs for satellite operators and service providers, ultimately raising the cost of satellite broadband for consumers in the Turks and Caicos Islands and delaying the deployment of satellite broadband services. Additionally, international best practices include minimizing local representation requirements. For example, the Organization of American States Inter-American Telecommunication

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[3] *See Modernization of Regulations for Deployment of New Satellite Access Technologies,* Informative Document, OAS/Ser.L/XVII.4.1.44, CCP.I-TIC/doc. 5518/24, Delegation of the Republic of Panama (April 29, 2024) (referencing Autoridad National de los Servicios Públicos, *AN No.19022-Telco de 2024-02-22, G.O. No. 29976-A del 26 de febrero de 2024*, https://asep.gob.pa/an-no-19022-telco-de-2024-02-22/ (last accessed April 18, 2025)) (attached as Appendix I).

[4] *See Regulatory Framework for Satellite-Based Electronic Communications Services in the Bahamas*, Consultation Document, ECS 75/2024, Utilities Regulation and Competition Authority (Dec. 9, 2024), Consultation-Document-URCA-satellite-regulatory-framework-06Dec2024.pdf.

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Commission (CITEL) recommends that its member states “minimize the local presence requirements in-country” as “allowed by local laws.”[5]

As to the Commission’s concerns regarding service outages, GSOA observes that satellite networks are inherently resilient by design. For example, satellite networks use geographically distributed network architectures where core network functionality is duplicated at different locations in the event of an electricity or Internet outage at one of their network facilities. In such an event, a redundant facility continues full network operations while technicians work to bring the other facility back online. Moreover, satellite networks use geographically diverse gateway antennas that serve to increase network capacity and add resiliency. Finally, many satellite networks use dynamic or reconfigurable satellite antennas such that the operators can quickly redirect their network capacity to locations in need of connectivity. In short, satellite operators manage the networks across massive geographies inclusive of multiple jurisdictions, gateway facilities, and central control systems. This operational strategy supports network resiliency and enables service continuity even in the event of local outages impacting the Turks and Caicos Islands.

The Commission is encouraged to take into account that requiring the localization of network management or data infrastructure would be inconsistent with the global and distributed nature of modern satellite networks. Instead, obligations related to security, lawful interception, or consumer protection can be fulfilled through locally licensed partners or resellers. This approach aligns with international regulatory best practices, including guidance from CITEL and the ITU, and balances national oversight with technical feasibility.

Question 4: How should the Commission proceed with the requirements for Islander Control for satellite internet services?

GSOA respectfully urges the Commission to consider the benefits to customers in the Turks and Caicos Islands of minimized local entity and foreign ownership restrictions. The corresponding reduction in barriers to entry will promote broadband access for customers in the Turks and Caicos Islands, including customers on underserved islands and those impacted by natural disasters. GSOA, therefore, encourages the Commission to allow licence applications from operators with neither local presence nor participation in the Turks and Caicos Islands. GSOA also requests that the Commission develop a licensing framework that processes applications on a non-discriminatory basis, regardless of national origin and foreign ownership, and without distinction between domestic and non-domestic providers. Other island nations,

[5] Guidelines for the Implementation of National Regulations that Facilitate the Deployment of Satellite Services, Particularly Broadband Services, in the Americas, PCC.II/Rec. 6 (II-03), Organization for American States, Inter- American Telecommunication Commission (2003), https://www.oas.org/citelevents/en/Documents/ByKeyword/ZGVwbG95bWVudCBvZiBzYXRlbGxpdGUgc2VydmljZXM%3d.

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such as Singapore[6] and the Philippines,[7] have found success in attracting satellite operators after removing foreign direct investment restrictions. Thus, such a regulatory environment in the Turks and Caicos Islands is expected to similarly result in increased choice and affordability for local customers and end users.

This framework also offers business flexibility to satellite operators in instances where local entity and foreign ownership requirements would be overly restrictive. For example, satellite operators should not be restricted by local entity and foreign ownership requirements in providing service to foreign-flagged ESIM (earth station in motion) that are in the territory of the the Turks and Caicos Islands for a temporary period or in selling capacity to a local licensee.

To the extent that the Commission maintains local ownership requirements, GSOA encourages the Commission to consider the benefits arising from providing an exemption to foreign direct investment restrictions and allowing foreign satellite system operators to hold gateway licenses for ground infrastructure in the Turks and Caicos Islands. Further, GSOA supports exemptions to permit foreign satellite operators to provide temporary services, including for emergency situations and disaster relief.

In line with the global nature of satellite infrastructure and the principle of proportionality, the Commission is encouraged to adopt a regime that allows foreign satellite operators to deliver wholesale services without local ownership obligations. Where local participation is mandated, the Commission could consider establishing clear exemptions for temporary services (such as maritime and aeronautical ESIM), disaster relief operations, or wholesale capacity provision to locally licensed service providers. Such targeted flexibility would ensure regulatory relevance without deterring essential services or investment.

Question 5: What approach should the Commission take to the licensing of VSAT terminals?

GSOA supports a model whereby a satellite operator is granted a single approval for all services and equipment intended to provide satellite broadband offerings in the Turks and Caicos Islands, including class licensing for both fixed very small aperture terminals (VSAT) and ESIM terminals. This model, also known as blanket licensing, would facilitate the rapid deployment and operation of multiple customer terminals and ensure satellite operators are able to quickly serve customers in the Turks and Caicos Islands.

Class licensing of VSAT would reduce the cost and administrative burdens incurred by satellite operators, regulators, and service providers using satellite connectivity to service their networks. Satellite systems are designed to provide broadband offerings to retail customers, among other uses, and are intended to serve many households, each of which will have at least one terminal, making individual licensing

[6] *See Full Competition in Singapore's Telecommunication Sector,* Infocomm Media Development Authority, https://www.imda.gov.sg/regulations-and-licensing-listing/competition-management/full-competition-in-singapores-telecommunication-sector (last visited April 17, 2025) (describing Singapore's transition to full market competition in 2000).

[7] *See Expanding the Provision of Internet Services through Inclusive Access to Satellite Services, Amending Executive Order No. 437 (S. 1998) for the Purpose*, Executive Order No. 127, (Mar. 9, 2021), https://jur.ph/law/expanding-the-provision-of-internet-services-through-inclusive-access-to-satellite-services-amending-executive-order-no-467-s-1998-for-the-purpose# .

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impracticable. Given that many ESIM and VSAT terminals will have identical performance, and will present identical issues in licensing, ESIM and VSAT terminals can be more efficiently handled in a single application rather than in many individual applications. Customers, in turn, would benefit from class licensing because they would have access to a greater choice of cost-effective and reliable broadband connectivity options to meet their needs at affordable prices.

A class licensing framework also aligns with the best regional practices. In 2024, CITEL issued guidance recommending the implementation of generic or class licensing frameworks in regulating the deployment of FSS Earth stations, including ESIM.[8] Jurisdictions in the Americas that have adopted the class licensing approach include Brazil,[9] Mexico,[10] and the United States,[11] among others. GSOA encourages the Commission to align its domestic framework with international standards for VSAT and ESIM.

Further, as discussed in response to Question 2 above, GSOA urges the Commission to establish regulatory fees that are reasonably tailored to recover the costs of class licensing—and not assessed on a per-terminal basis, which could raise the costs of service to end users. A cost-based model would better enable the provision of satellite services and, as a result, amplify the benefits that satellite broadband systems can bring to customers in the Turks and Caicos Islands.

High VSAT licensing fees can discourage satellite service providers from scaling their networks. If each VSAT terminal carries a high regulatory cost, satellite service providers may limit coverage or delay deployment, particularly in low-density markets such as small islands. However, affordable fees create a more investment-friendly environment and attract both regional and global satellite service providers. In addition, it is undeniable that satellite Internet services provide massive social and economic benefits to the people of TCI. From a public value perspective, lower fees are justified even if they don't generate high direct revenues.

Question 6: Do you have any comments on the Commission's assessment of the potential interference between satellite terminals and other services?

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[8] Guidance for Blanket Licensing Regimes for Ubiquitously Deployed Fixed Satellite Service (FSS) Earth Stations, PCC.II/Rec. 68 (XLIII-24), Organization for American States, Inter-American Telecommunication Commission (2024), https://www.oas.org/citelevents/en/Documents/DocumentsFile/2804.

[9] National Telecommunications Agency (Anatel), Act No. 6481, (Oct. 27, 2020) https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw_9INcO7jzvMNDMPftrWAw_NzbMK-uY1AmfomdllURNDjECjg_T6v5sKZxMHECoFQWn4U0-fw0Q94otSaDqQbKlTZWThz (describing telecommunications stations eligible for blanket licensing, including VSAT antennas with a diameter of less than 2.4 meters).

[10] *See* Agreement by which the Plenary Session of the Federal Telecommunications Institute issues the Regulatory Provisions on Satellite Communications, Chapter IV, Section 1, Art. 106, Federal Telecommunications Institute, (Jan. 23, 2023), https://www.dof.gob.mx/nota_detalle.php?codigo=5677587&fecha=23/01/2023#gsc.tab=0.

[11] *See* 47 CFR § 25.115(f) (permitting applications for individual or blanket licenses for NGSO FSS earth stations).

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GSOA supports the Commission's determination that frequency uses in accordance with the International Telecommunication Union's (ITU) Radio Regulations will prevent significant interference problems between satellite services and fixed service (FS) point-to-point links. Technological innovation has made sharing between services increasingly feasible. For example, modern satellite systems employ frequency sharing techniques that can avoid harmful interference to other systems. GSOA encourages the Commission to consider and implement the spectrum-sharing rules of the ITU and any relevant ITU Recommendations. Satellite operators and service providers are able to provide higher quality connectivity services to customers where broadband systems are able to operate without harmful interference from other authorized services. Appropriate spectrum assignment mechanisms and technical conditions would enable terrestrial and space systems to coexist.

GSOA applauds the Commission's initiatives to develop GSO and NGSO ESIM operations and supports the adoption of ITU Resolutions to facilitate the deployment of FSS ESIM services in the country. Specifically, GSOA encourages the Commission to consider implementation of Resolution 121 (WRC-23)[12] for the operation of maritime and aeronautical ESIM communication with GSO systems in the Ku-band, Resolution 123 (WRC-23)[13] for the operation of maritime and aeronautical ESIM communicating with NGSO systems in the Ka-band; and Resolutions 156 (WRC-15)[14] and 169 (WRC-19)[15] for the operation of maritime and aeronautical ESIM communicating with GSO systems in the Ka-band.

With regards to ESIM communicating with NGSO systems, Resolution 123 (WRC-23) establishes important technical and operational parameters for cross-border conditions for NGSO ESIM in the Ka-band. GSOA encourages the Commission to further develop a national licensing framework to facilitate the ubiquitous deployment of NGSO ESIM services in the Turks and Caicos Islands for maritime, aeronautical, and land applications. Specifically, GSOA encourages the Commission to align any ESIM framework with the technical values set forth in ECC/DEC/(15)04[16] as these values reflect achievable operational parameters and include the land ESIM application. The Commission could also consider explicitly exempting ESIM onboard foreign aircraft and vessels from licensing where (i) they hold the necessary authorizations from their flag country, (ii) they operate on a non-interference basis, and (iii) they do not require connection to a local network.

GSOA further supports the development of a framework for ESIM communications with GSO systems in the Ku- and Ka-bands. ESIM communicating with GSO and NGSO systems in the Ka-band are able to effectively coexist using international procedures established by the ITU. Considering the Commission already contemplates ESIM operation with GSO systems through its adoption of footnote 5.517A in the

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[12] *See* ITU WRC-23 Final Acts, Res. 121 (WRC-23).

[13] *See* ITU WRC-23 Final Acts, Res. 123 (WRC-23).

[14] *See* ITU WRC-15 Final Acts, Res. 156 (WRC-15).

[15] *See* ITU WRC-19 Final Acts, Res. 169 (WRC-19).

[16] CEPT ECC, ECC Decision (15)04 (approved July 3, 2015 and amended November 20, 2020).

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National Table of Frequency Allocations[17] and recognizes that the technical and operational conditions of Resolution 169 (WRC-19)[18] sufficiently protect incumbent terrestrial services in the Ka-band, GSOA encourages the Commission to support Resolution 123 (WRC-23) as it provides for similar or identical protections. For example, both GSO ESIM Resolution 169 and NGSO ESIM Resolution 123 reflect the same limit of a maximum effective isotropic radiated power spectral density towards the horizon of 24.44 dB (W/14 MHz) for M-ESIM.[19] Accordingly, GSOA respectfully urges the Commission to adopt Resolution 123 (WRC-23), in addition to Resolution 169 (WRC-19), and further expand the use of ESIM. Such harmonization with international best practices will facilitate smoother operations for ESIM services in the Turks and Caicos Islands. Generally, GSOA encourages the Commission to continue monitoring spectrum demand and evaluate allocations in line with industry and global practices.

GSOA also encourages the Commission to allocate the 17.3-17.7 GHz band to FSS (space-to-Earth) operations, consistent with the outcomes of the ITU 2023 World Radiocommunication Conference (WRC-23). Updating the 17.3-17.7 GHz allocation will allow FSS operators to provide high-speed satellite broadband service to even more customers, including in the Turks and Caicos Islands. The 17 GHz band has already been allocated to the FSS in Region 1, and the expansion of this allocation at WRC-23 to the FSS in Region 2 increases global spectrum harmonization for satellite services. In support of this allocation, CITEL's Permanent Consultative Committee II (PCC.II) adopted Recommendation 69, which encourages member states to facilitate the adoption of the frequency band for space-to-Earth operations.[20]

Question 7: What are your views on the extent to which the introduction of satellite-based services will impact the businesses of existing suppliers and affect consumers?

Satellite-based connectivity will bring many benefits to the Turks and Caicos Islands, including maintaining critical connectivity during disaster response and recovery efforts and bringing connectivity to underserved and unserved customers in the Turks and Caicos Islands. Satellite-based services play an important role in augmenting the offerings of incumbent services. For example, satellite communications can rapidly establish or restore communications in cases of emergency or disaster relief and help terrestrial mobile operators to expand the reach of their mobile networks, thereby extending connectivity to unserved or underserved communities. Satellite operators can also act as a backup for terrestrial networks during natural disasters and weather events, or in the instance of severed undersea fiber cables, thereby enabling the extension and resiliency of existing terrestrial coverage.

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[17] *See Turks and Caicos National Table of Frequency Allocations* 8.3 KHz to 275 GHz, Turks and Caicos Islands Telecommunications Commission (July 22, 2021), https://telecommission.tc/wp-content/uploads/2021/10/National-Table-of-Frequency-Allocations-Final.pdf.

[18] *See* ITU WRC-19 Final Acts, Res. 169 (WRC-19).

[19] *Compare id.*, *with* ITU WRC-23 Final Acts, Res. 123 (WRC-23).

[20] Use of the Band 17.3-17.7 GHz (s-E) For Fixed-Satellite Service in Region 2, PCC.II/Rec. 69 (XLIII-24), Organization for American States, Inter-American Telecommunication Commission (2024), https://www.oas.org/citelevents/en/Documents/ByDocumentType/4.

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Additionally, ubiquitous coverage enables satellite operators to bring connectivity to underserved and unserved customers who lack access to robust terrestrial offerings. In particular, satellite systems provide coverage that accelerates the ability of satellite operators and service providers to offer broadband connectivity in areas not served by fiber optic cable or terrestrial wireless networks, expanding the availability of broadband services throughout.

Further, satellite systems also provide supplemental support to enterprise and government customers by providing flexible and secure broadband to connect remote assets to the cloud. Government and enterprise customers across multiple sectors, including commercial maritime operations, can access primary and redundant connectivity for remote sites, securely connect to cloud-based applications, and access online data storage, processing, and analytics. Satellite operators therefore may bolster key economic sectors in the Turks and Caicos Islands in addition to providing ubiquitous coverage.

III. Conclusion

GSOA appreciates the opportunity to contribute to this consultation proceeding and remains at the Commission's disposal should there be any questions about this submission.

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Appendix I

(Modernization of Regulations for Deployment of New Satellite Access Technologies – English Translation)

Machine Translated by Google

ORGANIZATION OF AMERICAN STATES
ORGANIZATION OF AMERICAN STATES

Inter-American Telecommunications Commission
Inter-American Telecommunication Commission

44th Advisory Committee Meeting
PERMANENT I: TELECOMMUNICATIONS/ INFORMATION AND TECHNOLOGY COMMUNICATION
May 20-24, 2024
Panama City, Panama

OAS/Ser.L/XVII.4.1.44
CCP.I-TIC/doc. 5518/24 April 29, 2024
Original: Spanish

MODERNIZATION OF REGULATIONS FOR DEPLOYMENT OF NEW SATELLITE ACCESS TECHNOLOGIES

(Agenda point: 4.2.2)

(Informative document presented by the Delegation of the Republic of Panama)

Impact on the sector:

Information document on some provisions for the use of next-generation satellite systems and the **financial compensation for their use**, aimed at ensuring greater access to broadband in rural, hard-to-reach, and/or unserved areas, facilitating connections for the unconnected, and closing the digital divide in our country.

Executive Summary:

The National Authority for Public Services (ASEP) of Panama, based, among other things, on the UN 2030 Agenda in the section ***"Industry, Innovation and Infrastructure"*** established within the Sustainable Development Goals (SDGs) and on **Resolution AG/RES. 2966 (LI-O/21)** of the **OAS.** which considers the global telecommunications/ICT infrastructure to be a fundamental and indispensable input for global and national economies and for the well-being of all societies, made the modification to the satellite regulations.

Considering the aforementioned recommendations, in addition to adapting the provisions for the use of next-generation satellite systems, ASEP, through **Resolution AN No. 19022-Telco of February 22, 2024,** established a 75% reduction in the value of the fee, since the value of the previous fee was considered a barrier to closing the digital divide, since new generation satellites, called high-performance or *"High Throughput Satellites"*, require significant bandwidths of hundreds to thousands of Megahertz, which would generate high fee costs that discourage the entry of these new technologies.

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STARLINK

April 15th, 2025

Turks and Caicos Islands Telecommunications Commission

Mr. Kenva Williams
Director General
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Subject: Comments on Public Notice 2025-2 Consultation Framework for the Licensing of Satellite-Based Internet Service Providers.

Dear Director, General Williams,

STARLINK appreciates the opportunity to provide comments and information in response to Public Notice 2025-2L: Consultation Framework for the Licensing of Satellite-Based Internet Service Providers, published 27 March 2025 (the Notice).

Starlink is a global, low-earth orbit satellite system delivering advanced satellite connectivity anywhere on Earth. Our subscribers have leveraged Starlink for reliable and low-latency satellite broadband spanning everyday use cases and applications, in fixed-site, enterprise, and in-motion settings. Starlink is also committed to disaster relief, remote and rural connectivity, and supporting government resiliency.

In order for regulation to keep pace with innovation, it is essential to simplify existing frameworks by focusing on core principles aimed at enabling new technologies for the benefit of end users. By eliminating barriers to market entry, reducing administrative costs and tax burdens, and designing rules that recognize the intrinsically global nature of space-based services, the Commission can ensure its new framework stands the test of time.

Starlink commends the Commission for its forward-thinking approach and welcomes the opportunity to discuss the responses provided below.

Question 1: Should the Commission introduce a new licence type to facilitate the specific licensing of satellite-based internet services?

Starlink strongly supports the introduction of a new licence category to facilitate the authorisation of satellite-based internet service providers (ISPs) in Turks and Caicos.

Question 2: What approach should the Commission take to establish the licence fees for satellite-based internet services?

Starlink enthusiastically supports the creation of a new category for satellite services that reduces both the associated application fee and associated Initial Fee, Renewal of Licence Fee, and Regulatory Fee.

However, as the Commission rightly recognizes in Section B of the Notice, the licence fee rates contained in Schedule 1 of the Telecommunications (Fee Structure) Regulations 2022 have historically posed an insurmountable trade barrier to Starlink's ability to serve users in Turks and Caicos.

Ensuring reasonable regulatory and spectrum fees is a key contributor to both Starlink's and other non-geostationary orbit (NGSO) operators' ability to provide affordable, quality service to all of Turks and Caicos Islands. Accordingly, Starlink strongly advises the Commission to also lower the percentage-based values associated with both the Initial Fee and Renewal of Licence Fee from 7% annual gross revenue (AGR) to no greater than 2% annual net revenue (ANR). Starlink advises the Commission equally strongly to reduce the percentage-based annual Regulatory from 1.8% AGR to no greater than 1% ANR.

Regulatory fees that exceed the above-recommended thresholds do not accord with global best practice for pricing satellite spectrum and deter market entry by satellite-based ISPs by imposing acute administrative costs on doing business in Turks and Caicos.

The Commission should look to several of its neighbors in the Latin America/Caribbean region for positive examples of pricing satellite-based internet services. The case of El Salvador is emblematic, where the government issued a new Decree establishing a simplified operating mechanism through which satellite operators where fully exempted from the payment of the base price for the right to exploit radio spectrum frequencies for satellite communications and from the payment of the annual fee for its administration, management and surveillance. This, with the clear objective of reducing the digital divide in that country, in addition to maximizing the coverage of the national educational system, creating sources of employment and human development in most of the population.

As another example of sensible regulatory fees, in Saint Vincent and the Grenadines--a country with a population of around 103.000 people--the National Telecommunication Regulatory Commission granted a licence to Starlink with an initial application fee of $500.00 Eastern Caribbean Dollars (USD$185.00) for the class license application, $1,000.00 Eastern Caribbean Dollars (USD$371.00) for the spectrum authorization, and $5,000.00 Eastern Caribbean Dollars (USD$1,850.00) for the class licence initial fee. Thereafter, the NTRC collects an annual fee of $12,000.00 Eastern Caribbean Dollars (USD$4,450.00) for the spectrum authorization and a 3% annual revenue for the class licence.

In the same directions we are getting into a consensus with the rest of the ECTEL countries (St. Lucia, Grenada, Dominica and St. Kitts and Nevis) where they are adjusting their regulatory framework and regulatory and spectrum fee structure for NGSOs as follows:
For the Internet Network Service licence an application fee of $1,000.00 Eastern Caribbean Dollars (USD$370.00), an initial fee of $20,000.00 Eastern Caribbean Dollars (USD$7,400.00) and an annual fee of 3% Gross revenue. Additionally, for frequency authorization there would be an application fee of $1,000.00 Eastern Caribbean Dollars (USD$371.00) and an annual fix rate of 0.5% gross revenue plus a $1,500.00 Eastern Caribbean Dollars (USD$550.00) per band requested (note: frequency authorization does not have an initial fee). The population of these four countries will be a good point of comparison for Turks and Caicos Islands.

In conclusion, a new frequency authorization fee should be instituted for regulatory fees frequencies associated with Low Earth Orbit systems. This shouldn't be based on each terminal deployed but should be based on a blanket licence. Other examples are Trinidad and Tobago, where Starlink was licensed as a fix to multipoint network service. This essentially resulted in Starlink paying a flat fee for frequency assignments of around USD$57,000.00 in a country of 1.6 million people. In Barbados, Starlink was licensed based on a flat fee of $20,000.00 Barbadian dollars (USD$10,000.00) or 1% gross revenue, whichever is greater.

Question 3: In what way should the Commission approach the issues associated with the fact that the provision of some parts of a satellite service occur outside its jurisdiction?

The Commission should recognize that there are certain issues which will fall outside of its jurisdiction and exclude the requirement from the obligations from the licence of any satellite-based provider.

Question 4: How should the Commission proceed with the requirements for Islander Control for satellite internet services?

The Commission should allow licence applications from operators with no local presence nor Turks and Caicos Islander participation.

Foreign ownership requirements impose unnecessarily high barriers to entry and operation in the market with new business models and new technologies aimed at improving connectivity. To encourage the entry of new players into the market and promote the development of telecommunications infrastructure in Turks and Caicos, the Commission should eliminate regulatory barriers such as local ownership and control requirements, complex and restrictive regulations or regulations that do not reflect the reality of the service and make it difficult to obtain licenses, excessive requirements for permits or authorizations needed to operate in the market, as well as high and disproportionate costs that do not take into account the nature and scope of the service.

Question 5: What approach should the Commission take to the licensing of VSAT terminals?

The Commission should create a new VSAT Spectrum licence category for shared spectrum use and assess a fee for the rights to use the shared spectrum bands. In addition, the Commission should remove the requirement to license a single VSAT user terminal.

Starlink's customers connect to the Starlink network via a proprietary User Terminal. The User Terminal boasts a cutting-edge phased-array antenna design which connects to Starlink satellites. Designed for simplicity of use, the User Terminal will automatically align itself and connect to the Starlink constellation when powered on. All the hardware necessary to connect to the internet is included in the Starlink kit provided to consumers and requires no experience to set it up.

At any given time, every User Terminal has a view of multiple different satellites, each relaying communication via multiple directly steered beams. This extreme link diversity can guarantee quality of service and uptime beyond what has been possible to date, even performing in heavy rain conditions or under thick cloud cover. This is one of the many unique advantages that the phased array antenna design employed by Starlink offers its users when compared with traditional satellite internet or the VSAT user terminals.

Based on this, fees for NGSO spectrum use should be set administratively—and ideally be based on a nominal or cost-recovery pricing approach—because they use **shared use bands** where scarcity is not a current concern. Market mechanisms are neither applicable nor appropriate for shared spectrum, discourage efficient spectrum, and further impose significant burden on regulators to define a fee structure and set fees at a level that promotes NGSO entry and growth.

Satellite bands from C-band upwards work on a shared-use basis by managing interference with each other (and other services). Compared to terrestrial mobile operators, satellite operators have a much greater ability to avoid interference owing to the angular separation between satellites in the sky and the higher frequencies used. This difference between terrestrial mobile and satellite operators has profound implications for their ideal pricing schemes.

Terrestrial mobile operators require exclusive access to spectrum because two operators cannot use the same frequency, in the same location, at the same time. Therefore, when pricing spectrum to these services, the price paid by one operator must reflect the opportunity cost of denying access entirely to all other operators.

In contrast, two or more satellite operators can use the same frequency, in the same location, at the same time—as long as they have enough angular separation. Therefore, spectrum prices should reflect that granting access to one operator does not preclude other operators' use of the spectrum. Instead, satellite spectrum pricing should account for the marginal congestion produced by each operator and incentivize spectrum efficiency.

As the number of NGSO satellites, earth stations and user terminals grow, bands such as Ku and Ka are becoming busier, but they are still far from being congested. One reason why congestion has been avoided to date is that new systems are increasingly frequently agile, being programmed to detect nearby use and find clear channels and transmission paths. This also underscores the need for access to broader frequency ranges in these shared bands.

Frequency agility (small, steerable beams and frequency hopping capabilities) promotes spectrum efficiency, and so should be encouraged. However, some regulators use pricing formulas that charge based on the potential total bandwidth accessed. This is problematic in a shared use band because such fee structures incentivize satellite operators to stick to narrower ranges of frequency, thereby reducing agility, making congestion more likely and decreasing the ability to avoid or react to interference. Fees structures that charge a fixed fee regardless of bandwidth or charge on the basis of maximum bandwidth used at any particular time are more consistent with incentivizing, designing and implementing efficient systems.

Question 6: Do you have any comments on the Commission's assessment of the potential interference between satellite terminals and other services?

As with all components of the Starlink system, our satellites are designed and manufactured by SpaceX. This in-house expertise allows the company to constantly innovate on the design efficiency of the satellites, enabling dynamic system improvements as the constellation is replenished over time.

In addition, Starlink's satellite networks are designed to share spectrum and optimize usage, allowing multiple operators to use the same spectrum simultaneously and serve consumers with a variety of solutions. This coexistence on the same frequency - combined with good faith coordination - results in extremely efficient use of the spectrum

Most importantly our satellites and the constellation's design exceed all international and the US's domestic debris mitigation regulations, ensuring a safe and coordinated space environment for multiple operators and for many years to come.

Question 7: What are your views on the extent to which the introduction of satellite-based services will impact on the businesses of existing suppliers and affect consumers?

As previously mentioned, Starlink has invested in sophisticated technologies that allow it to efficiently share spectrum and thus **strengthen competition**. Spectrum sharing across the entirety of the globally harmonized Fixed Satellite Service ("FSS") bands is a core pillar of next-generation satellite systems. Rather than requiring exclusive spectrum access that precludes competition, Starlink's satellite networks have been designed to share spectrum and optimize use, enabling multiple operators to use the same spectrum simultaneously and serve consumers with a variety of solutions. This co-existence in the same frequency – combined with good-faith coordination – results in the extremely efficient use of spectrum.

Also, the purpose of satellite-based service is to complement traditional internet service providers to reach unserved and underserved areas. As our technologies don't require a critical terrain infrastructure investment, satellite-based service can complement other providers anywhere needed or during distress scenarios.

With Starlink, SpaceX can provide connectivity that will help to meet Turks and Caicos Islands connectivity goals, reduce the infrastructure investment required to connect every mile, and complement traditional internet service providers' service areas. At a Starlink user's location, the Starlink user terminal — a small, phased array antenna — connects with Starlink satellites to relay information to/from the customer. The Starlink satellites then connect to the nearby Starlink gateways, which connect to the internet via fiber.

Around the globe, Starlink has enabled communities in need of access to education, health services, enable remote work, and provide critical communications support during natural disasters. With Starlink, rural and remote classrooms can reap the same educational benefits as those in urban areas. Farmers can leverage data-driven approaches to agricultural production and fisherman can stay in contact with family back at port. When natural disasters strike, Starlink can be deployed rapidly to support emergency responders and enable communication for those impacted.

Sincerely,

Juan David Velez
Market Access Manager
SpaceX

April 25, 2025

Mr. Kenva Williams
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Turks and Caicos Islands Telecommunications Commission
872 Leeward Highway, Business Solutions Building
Providenciales
Turks and Caicos Islands

Submitted Electronically to: Consultations@tcitelecommission.tc

Subject: Turks and Caicos Islands Telecommunications Commission Consultation Framework for the Licensing of Satellite-Based Internet Service Providers (Public Notice 2025 – 2)

Viasat is pleased to provide comments to the Consultation Framework for the Licensing of Satellite-Based Internet Service Providers ("Consultation") issued by The Turks and Caicos Islands Telecommunications Commission ("Commission") on March 27, 2025. Viasat also welcomes this opportunity to provide information on important developments within the satellite industry that the Commission should consider as it embraces the potential entry of a new era of satellite communications services in The Turks and Caicos Islands.

Viasat commends the Commission on its efforts to develop a framework to better accommodate advancements in satellite technologies and related services ("Satellite Framework"). The Commission's work to develop the Satellite Framework is of critical importance as it will directly impact the structure and growth trajectory of the satellite sector. The Satellite Framework will create incentives to invest in the sector, enabling its continued evolution and encouraging the introduction of new and innovative service offerings. It will also impact the extent to which consumers are able to benefit from the services that satellite operators will make available.

Background on Viasat – A Global Leader in the Satellite Industry

By way of brief background, Viasat began in 1986 as a manufacturer of components for the satellite industry, gaining significant expertise over the next several decades developing innovative satellite technologies for spacecraft, ground infrastructure, user terminals and network design. After launching its own satellites beginning in 2011, Viasat's broadband services began to empower communities, students, and microenterprises, drive growth and connectivity, and support many new services in the areas of telemedicine, education, disaster recovery and relief, and agriculture.

Today, Viasat is also a global leader in Earth Stations in Motion (ESIM) connectivity, providing services to a variety of global and regional airlines and maritime vessels. In May 2023, Viasat acquired the global satellite company, Inmarsat, which was originally established in 1979 at the behest of the United Nations' International Maritime Organization (IMO), to operate a satellite communications network for the maritime community. Inmarsat has been at the forefront of providing communications solutions for the maritime industry for decades and is recognized as a leader in innovation and technology, receiving, among other awards, the International Maritime Rescue Federation (IMRF) Award for Innovation and Technology in Maritime Search and Rescue in October 2023[1], in addition to its leadership in providing services in the aeronautical sector, disaster response and satellite phone communications. With this transformational acquisition, Viasat has expanded its fleet of satellites and portfolio, which enables the company to bring together spectrum, satellite, and terrestrial assets, including 19 geostationary satellites (GSO) in space spanning Ka-, L- and S- bands.

It is against this backdrop of forty-five years of experience in the satellite industry that Viasat is pleased to provide the following comments to the Commission's very timely public consultation.

New Space Age Risk

Before responding to the specific questions raised in this Consultation, Viasat believes that it is very important, at the outset, to highlight some key issues that have the potential to threaten critical services provided by the satellite industry. While satellite holds much promise for improved connectivity for administrations around the world, including The Turks and Caicos Islands where Viasat has provided ESIM services since 2016, this new space age is not without risk. One troubling development is the overconsumption of scarce and shared orbital and spectrum resources by a few large non-geostationary (NGSO) constellations. Recently disclosed plans by one company highlight the imminent threat to shared and equitable use of spectrum and orbits by all space actors around the world—whether civil, scientific or governmental.

Just a single NGSO constellation seeks to (i) dominate about 51 GHz of spectrum, (ii) utilize as many as 34,000 satellites, (iii) spread those satellites across 444 km of space in the best orbits in low Earth orbit (LEO), and (iv) operate without regard to International Telecommunication Union (ITU) allocations and spectrum sharing provisions. This includes over 68% of all the spectrum allocated for fixed, broadcast and mobile satellite services under 200 GHz, and virtually all spectrum contemplated for nascent direct-to-device (D2D) service by satellite.

Reliable access to both spectrum and associated orbits drives the ability to meet evolving commercial, civic and military needs, and the ability of every nation, including The Turks and Caicos Islands, to participate in the global space economy.

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[1] *See*: Inmarsat Maritime safety team wins IMRF Award for Innovation and Technology in Maritime Search and Rescue. The Viasat-Inmarsat Maritime Safety team design and develop services to support search and rescue (SAR) operations, such as RescueNET, which delivers fast, reliable, and approved SAR communications from ship to shore, from shore to ship, and between maritime rescue coordination centers (MRCCs).

If one NGSO constellation is allowed to serve The Turks and Caicos Islands under these terms, no one else would be able to reliably share the same orbital resources. With over 34,000 satellites, potentially with 100's of beams on each satellite pointable in any direction, employing elevation angles as low as 5 degrees, and serving antennas as small as 15 cm, no one else could predict if their satellite system could operate alongside such a system, regardless of the orbits they use.

Absent the adoption of suitable regulatory limitations **at the market access stage**, The Turks and Caicos Islands would not be able to ensure that any potential national satellite system (or existing competitive systems) can share the same scarce orbital or spectrum resources. This issue is further compounded by the fact certain operators have a history of attempting to provide service in several markets around the world (including in the Caribbean) without a license, in flagrant disregard to national regulatory frameworks and licensing processes[2].

Attached to this submission as **Annex 1** is a White Paper that Viasat presented to the Commonwealth Telecommunications Organization (CTO) in February 2025 entitled **Digital Transformation and Sovereignty in the New Space Age**. We provide this White Paper as an important reference as the Commission considers the future of satellite services.

Viasat's Responses to The Commission's Consultation

Question 1:

Should the Commission introduce a new license type to facilitate the specific licensing of satellite-based internet services?

Response:

In its Consultation, the Commission states that in principle, the definition of an Internet Network or Service License could be applied to satellite-based internet services. However, the Commission believes that it would be beneficial to differentiate between the licenses awarded to terrestrial and satellite-based service providers so that the Commission can apply specifically tailored license provisions in order to distinguish between terrestrial and satellite-based licensees. As such, the Commission seeks comment on whether it should (i) license satellite internet services using existing license types or (ii) introduce a new license category to better reflect the different satellite internet services.

2 *See*: https://www.tas.sr/nieuws/2023/bekendmaking-van-de-telecommunicatie-autoriteit-suriname-betreft-starlink/; https://www.caymancompass.com/2025/01/13/starlink-satellite-terminals-hit-cayman-shelves-but-use-remains-restricted/

Satellite services can clearly play an important role in the telecommunications environment of The Turks and Caicos Islands consisting of 40 islands and cays, seven of which are inhabited. From improving broadband connectivity in underserved areas to disaster and emergency response to the provision of connectivity for ESIMs and ensuring an “always-there” mobile connection via Direct-to-Device (D2D) technology, satellite is as important today as it has ever been, particularly for archipelagos such as The Turks and Caicos Islands. At the same time, however, it is recognized that the increased use of space has led to urgent issues around the sustainable use of the fragile and limited spectrum and orbital resources, especially in Low Earth Orbit where there has been a proliferation of mega-constellation satellite launches.

Viasat generally agrees with the Commission that it would be beneficial to differentiate between the licenses awarded to terrestrial and satellite-based service providers and recognizes the importance of imposing certain license conditions that may be unique to satellite service providers. However, Viasat urges the Commission to recognize some of the key distinctions between the services that satellite providers themselves may offer and that one “license size” may not fit all satellite providers. In some instances, satellite operators may seek to provide services directly to consumers in The Turks and Caicos Islands **(Category 1)**. In other instances, existing terrestrial operators may simply seek to lease satellite capacity from satellite operators and resell such services to consumers in The Turks and Caicos Islands **(Category 2)**. In addition, some satellite service providers may only provide Earth Station in Motion (ESIM) services via satellite to aviation and maritime customers in the airspace and territorial waters of The Turks and Caicos Islands, without providing services directly to consumers within the territory **(Category 3)**.

With respect to **Category 1** above, where satellite operators are providing services directly to consumers within the territory of The Turks and Caicos Islands, Viasat believes that the Commission should introduce a new license category, to allow the Commission, among other things, to impose certain conditions that are unique to these satellite operators and to ensure that satellite operators comply with ITU Radio Regulations with regard to interference issues. Please see the response to Question 6 below for a more comprehensive discussion of some of the conditions that should be imposed. In short, Viasat urges the Commission to ensure that satellite operators providing services directly to consumers within the territory of The Turks and Caicos Islands comply with the Equivalent Power Flux Density (EPFD) limits of Article 22 of the ITU’s Radio Regulations. As noted in the response to Question 6 below, these conditions should be imposed at the market access stage, **prior to** licensing.

With respect to **Category 2** above, where existing licensed terrestrial operators are simply leasing satellite capacity from satellite operators, Viasat believes that there is no need to create a separate duplicative licensing regime for the satellite operator, particularly when that satellite operator is not providing services directly to end users. In such instances, it should be sufficient for the local licensed terrestrial operator to comply with any existing license conditions. As such, Viasat believes that to encourage the development of satellite services in The Turks and Caicos Islands, the Satellite Framework should allow local service providers to acquire satellite capacity and provide services to end users under their existing licenses, allowing blanket licensing for Very Small Aperture Terminals (VSAT), Internet of Things (IoT), and ESIM terminals. This approach will avoid a "double licensing" process that has the potential of unduly burdening the development of the industry.

Nevertheless, for this category, Viasat believes that the Commission should require the registration of satellite operators that provide capacity to local service providers and create a list of authorized satellite capacity providers (which would typically be foreign based). This would give the Commission the ability to ensure that service providers in the market meet the administration's requirements (for example, around national security, spectrum interference, or space sustainability criteria). This becomes particularly important as the Commission considers how to manage instances where local providers are leasing capacity from large mega-constellation NGSO systems. In such instances, Viasat recommends a more rigorous space segment registration for large constellation NGSO systems when allowing its use by local providers.

This process should incorporate additional pre-requisite technical criteria and authorization obligations to ensure the development of a vibrant and competitive satellite sector while providing for the safer and more sustainable use of space and facilitating more equitable access to scarce spectrum resources. It is recommended that the register should contain the following information, and be displayed on the Commission's website:

- ITU network name/id (filing)
- Name of the satellite operator
- Commercial name of the satellite network
- Frequency bands of operation in The Turks and Caicos Islands

We note that for D2D, this also works well, as local terrestrial service providers can procure satellite capacity to provision D2D services for their customers. Such an approach aligns with best practices in the region and avoids the duplication of a licensing approach in situations where local terrestrial service providers are simply acquiring satellite capacity from satellite operators, without the satellite operator providing services directly to end users.

With respect to **Category 3** above, where satellite service providers may only provide (ESIM) services to aviation and maritime customers in the airspace and territorial waters of The Turks and Caicos Islands, without providing services directly to end users in-country, Viasat believes that the Commission should maintain a license exemption regime and allow satellite operators to apply for an appropriate authorization to provide services that may not fall within any exemption.

Question 2: What approach should the Commission take to establish the license fees for satellite-based internet services?

In its Consultation, the Commission is considering taking two approaches for the imposition of fees for satellite based internet services: (i) to use "existing Internet Network or Service license categories and their corresponding rates and apply them to satellite internet services"; or (ii) "create a new category for satellite internet services while maintaining the 7% and 1.8% rates used to calculate the license and regulatory fees, while reducing the associated flat fees and application fee to align with the new service, reflecting the Commission's practice of benchmarking fees against similar licenses in other countries."

At this stage, Viasat wishes to emphasize that the fees that the Commission is contemplating to adopt by this Consultation should only apply to those satellite providers who are providing services directly to end users in-country (Category 1 referenced above) and not to satellite providers offering ESIM services to aviation and maritime customers who may operate in the airspace and territorial waters of The Turks and Caicos Islands on a very limited, temporary basis. As noted above, for such ESIM services, the Commission should maintain a license exemption regime and allow satellite operators to apply for an appropriate authorization to provide services that may not fall within any exemption framework. Viasat notes that numerous countries within the Caribbean, including ECTEL Member States, maintain a license exemption approach for the provision of ESIM services without the imposition of any fees. The European Commission on Posts and Telecom (CEPT) has also largely moved to a license exemption approach for user terminals and ESIM in many satellite bands, including the Ka Band.[3]

With regard to the proposed fees that Viasat believes are being contemplated by this Consultation for satellite providers who will provide services directly to end users in-country (Category 1), Viasat believes that the proposed fees have the potential of discouraging the deployment of broadband services as well as the broad distribution of user terminals in country. Viasat respectfully submits that reducing such fees will go a long way in encouraging investment and innovation for the ultimate benefit of consumers. Viasat encourages the Commission to maintain flexibility in the application of any current or proposed fees for this category of service providers.

3 *See*: ECC Decisions (05)01, (05)08, (13)01, and (15)04, inter alia.

Question 3: In what way should the Commission approach the issues associated with the fact that the provision of some parts of a satellite service occur outside its jurisdiction?

Viasat understands the Commission's concern that it may not have the same regulatory control over a satellite service as it would over a local service provider whose operations and infrastructure are located wholly within The Turks and Caicos Islands. As such, the Commission raises a valid concern that it may have limited recourse to "raise and deal with complaints about the quality of service to the consumer" or address issues related to outage notifications, among other things. As such, the Commission is considering ways to approach these issues, for example, by: (i) including "the necessary provisions in the licenses of any satellite services, with a requirement to make best efforts to ensure that they are met"; or (ii) recognizing "that there are certain issues which will fall outside the jurisdiction of the Commission and exclude the requirement from the obligations from the license of any satellite-based provider."

Viasat believes that the use of best efforts in license provisions holds little regulatory power and can easily be ignored. This becomes particularly important when satellite providers are required to comply with technical conditions to ensure that they avoid interference to other services. In its Consultation, the Commission recognizes that each country must ensure that its own satellite operators follow the rules and conditions contained in the ITU Radio Regulations. As such, Viasat encourages the Commission to include, at a minimum, specific provisions in its licenses to ensure that operators adhere to the ITU's Radio Regulations with regard to interference, including the requirements contained in Articles 21 and 22 of the ITU's Radio Regulations. Please see the response to Question 6 below for a more comprehensive analysis of this issue.

National licensing processes should adhere to ITU instruments, standards, recommendations and regulatory procedures. However, it is important to recognize that this principle does not preclude The Turks and Caicos Islands (or any other nation) from adopting additional instruments and regulatory procedures to protect sensitive data (for example, government records or financial data). Indeed, this is specifically envisioned by relevant ITU instruments and regulatory procedures themselves. For example, Article 18 of the ITU Radio Regulations specifically reserves to individual Member States the authority and obligation to develop and implement licensing policies at the national level — including through the adoption of additional substantive requirements designed to safeguard The Turks and Caicos Islands policy interests.

Safe and Sustainable Use of Space and Equitable Access

Given the importance and timeliness of the Commission's Satellite Framework Consultation, Viasat urges the Commission to include the relevant policy principles outlined below within the Satellite Framework. In particular, considerations relating to the **safe and sustainable** use of space as well as **equitable access** to both spectrum and orbits are key determinants for The Turks and Caicos Islands' meaningful participation in the new space economy and the assurance of a competitive marketplace for satellite capacity.

Unfortunately, in January of this year, The Turks and Caicos Islands experienced debris from a space rocket explosion crash into its territory.[4] This incident required immediate action by the government to ensure the safety of its citizens and to assess the extent of any physical damage. While the response efforts included multiple government departments in The Turks and Caicos Islands, including the Department of Disaster Management & Emergencies, the Department of Environment and Coastal Resources, the Department of Maritime Shipping, the Environmental Health Department and the National Security Secretariat, the Commission is in a unique position to develop policies that can lay the foundation for important considerations relating to the safe and sustainable use of space. Sadly, the need for administrations to develop policies for the safe and sustainable use of space to ensure the safety of its citizens is no longer an academic exercise but a harsh reality. The threat of space orbital debris is also heightened by the proliferation of mega-constellation satellite launches taking place in Low Earth Orbit. As such, Viasat respectfully urges the Commission to consider the following principles in this area.

- **Space Sustainability**: Actions must be taken today to "ensure that humanity can continue to use outer space for peaceful purposes and socioeconomic benefit now and in the long term."[5] The space surrounding the earth is a finite resource. The emergence of large non-geostationary (NGSO) constellations can trigger the following effects that may impact the long-term sustainability of space activities by the over-exploitation of Low-Earth Orbit (LEO):
    - Overconsumption of spectrum and "look angles," reducing the protection of other NGSO as well as GSO satellites serving markets like The Turks and Caicos Islands;
    - Increased risk of collisions that can lead to unsustainable levels of space debris that can foreclose access to space for all mankind;
    - The potential for large quantities of deorbiting satellites, burning aluminum in the upper atmosphere thereby releasing aluminum oxide, can damage the Earth's atmosphere and effect climate change through, among other things, the depletion of the ozone layer;
    - The same aluminum oxide increases the risk of neurological diseases like Alzheimer's and Parkinson's;

4 *See:* Turks and Caicos Weekly News, January 31, 2025, SpaceX Debris Recovery Underway in the TCI, Public Urged to Report Debris; Turks and Caicos, The Sun, January 23, 2025, Turks and Caicos, UK Officials Meet with SpaceX Team.

5 *Definition of space sustainability from the Secure World Foundation*.

- Impairing critical optical and radio astronomical research by disrupting the visible night sky as well as critical asteroid detection and defense capabilities; and
- Creating light pollution, with the resulting negative impacts on the health and quality of life of humans, plants and animals.

Adding a Space Sustainability principle to the Satellite Framework will ensure long-term, safe, and reliable access to and use of space for the benefit of all.

- **Equitable Access to orbital and spectrum resources**: As mentioned above, the LEO orbit is a finite resource that needs to be administered carefully to ensure that markets remain competitive and national systems in the future can be deployed and operated. Likewise, the spectrum environment needs safeguarding to ensure protection of all systems from interference from the largest NGSO constellations. Recently, large NGSO constellations are consuming the entire aggregate EPFD "budget" that must be apportioned among all NGSO systems using the same or overlapping frequencies, blocking other LEO systems and overpopulating orbital planes that constrains the orbital access for GSO and NGSO systems. If this goes unchecked, it will harm consumer choice and chill investment and innovation.

Question 4: How should the Commission proceed with the requirements for Islander Control for satellite internet services

Viasat respects and fully appreciates the spirit and intent of Section 9 of the Telecommunications Ordinance requiring that a licensee be owned and controlled by Islanders. However, the strict application of this requirement has a chilling effect on potential investment and can lead to companies avoiding The Turks and Caicos Islands as a potential market, in favor of other markets that may provide a more flexible and open environment for doing business. While the Minister may grant a waiver from Islander Control requirements, seeking such a waiver can be time consuming and potentially lead to inconsistent precedent.

As such, Viasat fully supports the Commission's consideration of alternative approaches. In considering these approaches, the Commission states that (i) satellite operators could establish their own company based in The Turks and Caicos Islands and apply for a telecommunications license in their own right; (ii) satellite operators could partner with an existing telecommunications licensee, who would then provide the service under their license; or (iii) the Commission could allow license applications from operators with no local presence nor Turks and Caicos Islander participation.

Viasat believes that approach (iii) above is most appropriate for those satellite operators providing ESIM services to aviation and maritime customers who only operate in the airspace and territorial waters for a very limited and temporary basis. Viasat encourages the Commission to adopt this approach for ESIM services.

With respect to approach (ii) above, having the ability to partner with an existing telecommunications licensee offers some flexibility to companies to structure a mutually beneficial arrangement without the need for pre-determined ownership requirements. In addition, as contemplated by approach (i) above, establishing a company and applying for a telecommunications license in the company's own right may be the preferred approach by some companies but should not be a pre-condition to obtaining a license. In summary, Viasat believes that removing any Islander Control requirement can lead to the influx of additional operators providing service in-country, spurring additional investment.

Question 5: What approach should the Commission take to the licensing of VSAT terminals?

With respect to the licensing of VSAT terminals, Viasat believes that the Commission should issue a class license for VSAT terminals, meaning that certain types of user equipment would not require an individual license to operate (larger dishes would still require a license as per the current arrangements). In this context, Viasat supports the implementation of blanket licensing for VSAT terminals, as well as for IoT, D2D and ESIM terminals, as this approach would streamline the authorization process and facilitate the large-scale deployment of satellite terminals in The Turks and Caicos Islands. However, the Commission may wish to retain the option to license terminals individually in regulatory scenarios where there is a reason to believe that the operation of such terminals could pose risks that warrant closer evaluation on a terminal-specific basis prior to licensing (e.g., where terminals would be deployed in the vicinity of high-priority facilities using the same or adjacent frequencies that could suffer interference as a result).

Assuming that the Commission adopts a blanket licensing approach, it should ensure that the associated fee structure does not impede the benefits of that approach. Viasat suggests that the Commission should consider adopting a fixed fee structure for blanket-licensed satellite terminals. Among other things, the fixed-fee approach would reflect that all blanket-licensed terminals use the same spectrum in similar ways and collectively impose certain administrative and management costs on the Commission that are independent of the number of terminals licensed or operated—and should therefore be subject to a single, fixed fee (spectrum fees should be designed to recover relevant administrative and spectrum management costs and not more). In addition, this approach would avoid the administrative challenges associated with verifying and validating the number of domestic satellite terminals deployed.

When considering a blanket licensing approach, it will be very important to ensure that operators adhere to the protection rules set out in ITU Radio Regulations and that services in the same frequencies or in adjacent bands are protected. Article 22 of the ITU Radio Regulations sets out critical protection rules to ensure that large NGSO constellations do not overconsume spectrum and orbits, and that they only use a portion of the "look angles" allotted to them (1/N, where N is the number of authorized NGSO constellations). For additional information on this topic, please see Viasat's White Paper "*Ensuring Innovation and Growth Opportunities in the New Space Age*"[6].

Question 6: Do you have any comments on the Commission's assessment of the potential interference between satellite terminals and other services?

Viasat commends the Commission for considering important issues of interference which have the potential to impact not only services provided to consumers in The Turks and Caicos Islands but also services provided to government entities. While the thrust of the Commission's inquiry in this regard may relate primarily to potential interference both to and from VSAT terminals and fixed point-to-point links, it is very important for the Commission to understand some of the key issues surrounding interference between satellite operators and how this may impact service in The Turks and Caicos Islands.

To provide more context and to emphasize the importance of this issue, Viasat supports the guidance and rules already provided by the ITU Radio Regulations, which set out appropriate protection criteria for both satellite and other services in the same frequency bands and adjacent bands, especially Articles 21 and 22 of the ITU Radio Regulations for large NGSO constellations. Based on those regulations, the current satellite systems in operation were designed (and future systems are being designed) under the ITU rules already established, so it is important not to abandon these ITU rules that have fostered a global ecosystem for satellite systems.

We wish to emphasize that, as noted in greater detail below, Article 22 of the ITU Radio Regulations, the principal provision relating to the coexistence of GSO networks and NGSO systems, requires that NGSO systems not cause **Unacceptable Interference** to GSO networks, which is a much stricter standard than **Harmful Interference**.

In particular, large NGSO systems pose interference risks to other operators, including GSO operators. Indeed, the proliferation of large NGSO satellite systems at LEO presents a wide range of challenges for regulators and other satellite operators around the world, by:

6 *See:* Ensuring Innovation and Growth Opportunities in the New Space Age (March 2024), available at: https://www.viasat.com/content/dam/us-site/corporate/documents/Ensuring%20Innovation%20and%20New%20Opportunities%20in%20the%20New%20Space%20Age%20(Updated%20March%2013%202024)(A4).pdf

- Generating unacceptable levels of interference through the operation of vast numbers of satellites (up to tens of thousands) covering the sky and "look angles", and constraining the ability of other NGSO systems and GSO networks to deploy, innovate and compete;
- Consuming an undue amount of spectrum and orbits in contravention of the ITU Constitution—and specifically Article 44, paragraph 2, which recognizes that radio frequencies and orbits are limited natural resources and must be used "rationally, efficiently, and economically;"
- Consuming more than their fair share of the overall interference "budget" that all NGSO systems may cause to GSO networks, thereby hindering opportunities for other parties, including national operators, to operate their own NGSO systems; and
- Precluding equitable access to spectrum and orbits by other NGSO systems by using up all available "look angles" through the extremely large number of satellites within their networks and particularly when employing small user terminals with wide beamwidths.

In light of the above, regulators have established or are considering the development of NGSO space segment registration or authorization processes, aimed at preserving healthy competition, ensuring sustainable development, and managing interference. Regulators have also acknowledged the potential negative impact of large NGSO systems and proposed safeguards such as mandatory compliance with Article 22 EPFD limits. However, given SpaceX's filings last year with the U.S. Federal Communications Commission (FCC), which include (i) a proposal to degrade the EPFD limits established in Article 22 and Resolution 76 of the ITU Radio Regulations[7], and (ii) a proposal to separate filings seeking authority to operate without regard to the EPFD limits, and seeking authority to launch an additional 29,988 satellites in LEO, taking it to an unprecedented total of over 34,000 satellites[8]. There is a crucial need for the Commission to further strengthen the regulatory measures for mitigating the risks presented by large NGSO systems.

To this end, Viasat takes this opportunity to explain why NGSO mega-constellation systems present significant and unanticipated threats to GSO systems and urges the Commission to take

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7 *See: In the Matter of Revision of the Commission's Rules to Establish More Efficient Spectrum Sharing Between NGSO and GSO Satellite Systems*, Petition for Rulemaking, RM-11990 (Filed 9 August, 2024), https://www.fcc.gov/ecfs/document/10809160739016/1.

8 *See: Space Exploration Holdings, LLC*, Call Sign S3069, File Number SAT-MOD-20241011-00224 (Filed 11 October 2024), https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr031b.hts?q_set=V_SITE_ANTENNA_FREQ.file_numberC/File+Number/%3D/SATMOD2024101100224&prepare=&column=V_SITE_ANTENNA_FREQ.file_numberC/File+Number and File Number SAT-AMD-20241017-00228 (Filed 17 October 2024); https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr031b.hts?q_set=V_SITE_ANTENNA_FREQ.file_numberC/File+Number/%3D/SATAMD2024101700228&prepare=&column=V_SITE_ANTENNA_FREQ.file_numberC/File+Number.

appropriate action, at the market access stage, *prior to* licensing a mega-constellation NGSO system. In this regard, Viasat proposes the following:

Requirement A – Protect GSO networks from unacceptable interference generated by NGSO systems

The potential for disruption to GSO networks from co-frequency NGSO systems is well-known. This concern prompted the development of various ITU Radio Regulations designed to protect GSO networks from interference generated by NGSO systems. These regulations define the terms under which both GSO and NGSO systems can coexist. The principal provision for coexistence, No. 22.2 in the ITU Radio Regulations, requires NGSO systems to not cause **unacceptable interference** to GSO networks. EPFD limits apply in certain bands that, if actually met during operation, fulfill the ITU Radio Regulation No. 22.2 obligation with respect to an NGSO system. There are two types of EPFD interference limits:

- "Aggregate" EPFD limits constrain the amount of interference that all NGSO systems may generate in total, on a cumulative basis. These aggregate limits must be shared and apportioned among all NGSO systems using overlapping frequencies.
- "Single-entry" EPFD limits constrain the amount of interference that one NGSO system itself may generate with respect to GSO networks. The single-entry limits were established based on an apportionment to a single NGSO system of a portion of the applicable "aggregate" EPFD limits.

Single-Entry EPFD limits to be met by a single NGSO system

Based on the data provided in a given ITU EPFD input filing, the ITU's Radiocommunication Bureau (BR) does a limited assessment of the EPFD levels, based on ITU-R Recommendation S.1503[9], that could be generated by an NGSO system with respect to one particular combination of earth station location and GSO satellite location (so called "worst-case geometry"). This limited assessment has little bearing on the interference that an NGSO system can be expected to produce at various locations.

The ITU alone cannot effectively check all of the ways an NGSO system operator may try to artificially specify EPFD inputs in a way designed to "pass" the ITU's spot checks regarding EPFD without reflecting how the NGSO system actually would operate and affect every nation. And

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[9] ITU-R S.1503: Functional description to be used in developing software tools for determining conformity of non-geostationary-satellite orbit fixed-satellite service systems or networks with limits contained in Article 22 of the Radio Regulations.

there are multiple and well-documented examples of this already occurring. Consequently, it is imperative that the individual administrations and regulators that consider authorizing, or granting market access to NGSO system operations, take responsibility for ensuring that NGSO operators specify accurate and appropriate EPFD inputs, and otherwise comply with the relevant EPFD limits.

In an important contribution to ITU Working Party 4A (WP4A),[10] it was demonstrated how one NGSO operator has artificially designed a single PFD mask of one of the orbital shells, to force the current algorithm to select a specific and favourable, but non-representative, 'worst-case geometry' (WCG) for the entire NGSO system. Without inclusion of that particular PFD mask of the orbital shell, which has not been authorized by the filing administration for operation, S.1503-2 software produces higher EPFD with a lower number of satellites. Such practices therefore conceal the interference produced by all other PFD masks of the same NGSO system filing that actually contain higher PFD levels at locations outside the WCG, leading to large exceedances of the limits at geometries other than WCG. These EPFD limit exceedances are not identified in the examination based on S.1503-2 software, which may result in a flawed favourable finding for an NGSO system based on an engineered PFD mask that forces the software to evaluate interference towards GSO networks in a limited and non-representative location on Earth. As the ongoing work in WP4A reflects, there are significant shortcomings in the outdated Recommendation S.1503 software used by the ITU. Fortunately, alternative commercial software is available, and more is being developed that allows a more accurate assessment of the expected interference.

Aggregate EPFD limits to be met by all NGSO systems, collectively

ITU Radio Regulations Resolution 76 (Rev. WRC-23) defines the aggregate EPFD limits that must be met by all NGSO systems, collectively, and calls for administrations to take all possible steps to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by NGSO systems does not exceed those limits. In the event that the aggregate EPFD limits are exceeded, it further calls for administrations to take all necessary measures expeditiously to reduce the aggregate EPFD levels to the limits given in Tables 1A to 1D of Res. 76.

A critical component of the aggregate EPFD assessment is to define a methodology by which multiple NGSO operators would reduce EPFD levels in case of any exceedance. Such a reduction in EPFD level must be proportional to the contribution of each NGSO system towards the

[10] *See:* WP4A document 4A/94 (18/04/2024) *Working document towards a preliminary draft revision of Recommendation ITU-R S.1503-4 - Underestimation of non-GSO interference arising from the use of worst-case geometry in S.1503 and necessity to supplement it with grid-based EPFD analysis*.

aggregate EPFD. Inequitable sharing of the aggregate EPFD budget amongst NGSO systems would hinder opportunities for other parties including national NGSO systems and new entrants.

Before registering any NGSO system to operate, the Commission should define a methodology for how the aggregate EPFD budget can be shared amongst all NGSO systems and how the NGSO systems will reduce their EPFD levels, in case of exceedances. It is unreasonable to assume that NGSO licensees will adapt their operations if the aggregate EPFD exceedance is evaluated in The Turks and Caicos Islands at a later time, especially when there is no methodology defined upfront at the time of license grant. At the very least, it will be a long process that will cause harm to GSO operations throughout the time of the aggregate EPFD exceedances by the NGSO systems. Moreover, should interference issues arise, isolating and identifying individual EPFD contributions of every NGSO system toward the aggregate EPFD will be an impossible task.

As noted, Viasat encourages the Commission to conduct an independent assessment of potential for interference, from a single NGSO system and all NGSO systems collectively. Such assessment should require from an NGSO operator:

- A demonstration of compliance with the single-entry and aggregate equivalent power flux density (EPFD) limits prescribed in the ITU Radio Regulations Article 22 (Art. 22) and ITU Resolution 76, respectively. This should include:

    - A demonstration for the LEO constellation as a whole**;**
    - A demonstration for the specific portions of the LEO constellation proposed to serve (including the exact satellite altitudes and inclinations proposed to be used);
    - A demonstration for a suitable number of representative geographic locations and for all GSO satellite networks serving, or proposed to serve;
    - A demonstration of how the LEO system avoids interference to GSO networks created by numerous LEO earth station and satellite antenna sidelobes, and earth station antenna backlobes, particularly when phased array antennas are employed;
    - A demonstration for the operation of the LEO constellation alongside the operation of all other co-frequency NGSO constellations serving The Turks and Caicos Islands and;
    - Information on the ITU filing under which each of the NGSO systems seek to operate in The Turks and Caicos Islands and where the NGSO system operates under multiple filings, each application should contain EPFD input files (e.g.,

SRS and mask database) that represent their system as a whole and that are consistent with their ITU submission.

Proposed License Conditions Related to Interference

In order to ensure that the expected interference evaluated based on the above assessment is not exceeded during NGSO operations, the Commission should consider imposing the following conditions on current and prospective licensees:

- Each individual NGSO system shall comply with the single-entry EPFD limits in Art. 22 and all NGSO systems, collectively, shall comply with aggregate EPFD limits in Resolution 76 (Rev. WRC-23);
- The NGSO operator shall operate its system as a single constellation for purposes of the EPFD limits, no matter how many ITU filings it may seek to operate under;
- The NGSO operator shall confirm that its deployed NGSO system is fully consistent with its ITU filings; and
- The NGSO operator shall comply with all the parameters provided in its ITU filing, specifically:
  - Maximum number of co-frequency beams serving a specific location, commonly known as "Nco,"
  - Minimum GSO arc avoidance angle, commonly known as "alpha angle,"
  - The downlink power flux density mask (PFD mask), taking into account the actual characteristics of the NGSO system as deployed, including the radiation pattern of its satellite antenna.

As mentioned above, the aggregate EPFD limits define the interference that all NGSO systems, collectively, can generate towards the GSO network and thus establish a total interference budget that must be shared by all NGSO systems. If, for example, one NGSO operator is allowed to operate with two NGSO systems (e.g., Generation 1 and Generation 2) and each one has a separate "share" of that aggregate budget, that NGSO operator will be able to consume a disproportionate share of the total aggregate EPFD budget, which must be shared amongst all NGSO operators. To avoid this result, it is critical to evaluate all the NGSO satellites operated by a given NGSO together as a single system.

The need for the conditions discussed above is reinforced by the Director of the ITU's Radiocommunication Bureau report, which explains that the practice of splitting an NGSO satellite system into several filed systems, "may affect the effectiveness of single-entry limits contained in Art. 22 to protect geostationary systems or have an impact in the implementation of Resolution 76 (Rev.WRC-15)."[11]

Requirement B - Ensure large NGSO constellations share frequencies and orbital resources effectively with other NGSOs

Large NGSO systems with thousands of satellites, particularly when they employ small user terminals, can consume significant portions of the "look angles" toward space and LEO orbits as well, preventing use of the sharing tools that have been employed successfully for decades among certain NGSO systems. This threat to NGSO spectrum sharing occurs when large LEO constellations "blanket the sky," causing many in-line interference events limiting and sometimes completely blocking other NGSO systems from sharing the same spectrum. A large NGSO system would rarely (if ever) experience this problem itself because it has a far greater number of satellites than smaller NGSO constellations, which provides the large NGSO system with alternative communications paths in which the same spectrum remains available for its use. The upshot is that a large NGSO system would have little incentive to avoid in-line interference events; large numbers of in-line interference events would harm smaller NGSO systems without materially impacting the large NGSO system's operations. As a result, the large NGSO system can hinder other satellite operators, including new entrants, from accessing and using shared spectrum and orbital resources in the public interest.

To avoid this result and to ensure large NGSO constellations share frequencies and orbital resources effectively with other NGSO systems, it is critical for the Commission to require an NGSO operator to:

- Operate with only 1/n of the "look angles" in a given country, where "n" is the number of NGSO systems authorized to serve in the same frequency band (whereby NGSO systems serving a country in overlapping frequencies would divide the range of satellite azimuths as seen from a location on the Earth (i.e., "look angles") whenever the potential for NGSO/NGSO interference exists at that location);
- Coordinate in good faith and in advance with other NGSO systems so that all "n" "look angles" may be used to serve by different NGSO systems; and
- Maintain an orbital tolerance of +/- 2.5 km for the apogee and perigee of each NGSO satellite, and a 0.5° tolerance for each orbital inclination the NGSO system employs, in

[11] Director, ITU Radiocommunication Bureau, Preliminary Draft Report of the Director to WRC-23 on the Activities of the Radiocommunication Sector Experience in the Application of the Radio Regulatory Procedures and Other Related Matters, Addendum 2 to Document 4-3 (September 2023), at 28-29. Resolution 76 is discussed below. It addresses compliance with limits on the entirety of the aggregate EPFD↓ created by all NGSO systems of all operators.

order to ensure other NGSO systems may access the shared LEO space (or comply with such other orbital tolerance requirements as the Commission deems appropriate to ensure the ability of other satellites and systems serving its territory to operate in the same, or overlapping, orbits occupied by the NGSO system).

Viasat recommends that the Commission review the coordination terms used to provide service within The Turks and Caicos Islands to ensure that those agreements do not unduly constrain other NGSO systems and do not result in a disproportionate use of available "look angles" by a single NGSO operator.

Requirement C – Take concrete steps to limit safety risks posed by NGSO operations, including by submitting a collision risk analysis of the NGSO system, as a whole, for the full orbital life of each satellite and its replacements, and as system characteristics and the orbital environment may change.

Question 7: What are your views on the extent to which the introduction of satellite-based services will impact the businesses of existing suppliers and affect customers.

The introduction of satellite-based services will have a positive impact on the businesses of existing suppliers and consumers. Satellite services play a significant role in closing the digital divide by providing connectivity to unserved and underserved areas, providing complementary solutions in regions already covered by terrestrial networks, and fulfilling a range of essential and critical communication requirements.

Satellite services can provide connectivity for countless applications that benefit unserved and underserved communities. Satellite services ensure adequate connectivity for schools in rural areas and provide those students with similar opportunities as students in urban areas. Moreover, satellite services connect public institutions and enable them to receive and send emergency alerts and transmit other critical safety information to improve lives in rural and remote communities.

In that context, the introduction of satellite services can help to fill gaps where there is no connectivity. Satellite services can reach geographical areas that by other means would not be possible to get connected. Additionally, satellite services can complement local networks to provide broader telecommunications services. This will help to close the digital divide, to bring more options to the end user and to foster healthy competition in the market. Satellite services offer the implementation of access points that can be managed by local citizens, thereby strengthening the local economy and enhancing the development of small businesses. Satellite availability and increased affordability will allow small and mid-size enterprises to flourish, accelerate the digital transformation, and diversify the economy.

Viasat reiterates its appreciation to the Commission for providing an opportunity to participate in this important consultation.

Respectfully submitted,

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