Asia Pacific Communication Specialist
(PNG) Ltd 1-101851
Level 2, Vodafone Building
Port Moresby. PNG

Public Consultation Discussion Paper STARLINK

Date: 11th September 2023

RE: Public Consultation Discussion Paper on Licensing for Non-Geostationary Orbit Satellite Services in PNG

Dear NICTA,

I write to express the views of Asia Pacific Communications Specialists regarding the proposed implementation of a licensing amendment to the *Standard and Special Terms and Conditions of Individual Licenses Rule 2011*, which NICTA intends to make to clarify the regulatory conditions in the use of low earth orbit (LEO) satellite networks. Though there is much overlap between our own views, we are concerned that the proposed changes do not fully provide the type of compass the Nation needs to lead it towards the future. Specifically, we believe the proposed changes do not constitute an active effort to drive technological progress in the implementation of satellite technology in such a way that will equalise access to these services to bridge the divide in internet access in PNG. Without a guiding philosophy that explicitly defines the goals of NICTA towards low earth satellite technology, it is our belief that Papua New Guinea will fall behind the rest of the world. We express this view in good faith, considering that this low orbit satellite technology stands in competition to the services we offer at APCS. We thank you for the opportunity you have allowed for stakeholders to express their varied views, and hope you take the time to consider our concerns.

Considering the Benefits of Low-Earth Orbit Satellite Technology

As you are no doubt aware, internet coverage as it currently exists, especially pertaining to remote and rural regions, has proven to be largely inadequate and difficult to improve due to geographical challenges that have so far proven insurmountable with terrestrial infrastructure. This means that a significant proportion of Papua New Guineans have been locked out of accessing reliable internet services, creating an unacceptable digital divide in our Nation. This emerging technological chasm must be as much on the mind of NICTA as it has been on our minds at APCS. For our own part, we have asked ourselves a set of questions about the direction of technological progress that we believe need clear and concise answers:

- Given the challenges in providing high-speed internet to rural and remote areas using traditional terrestrial infrastructure, what alternative technologies might address these challenges more efficiently, which have not been approved?

- How does the financial and environmental cost of building and maintaining traditional broadband infrastructure compare to the deployment of newer technologies?

- What are the current benchmarks for acceptable internet speed and reliability in our nation?

- How does our nation's strategy align or diverge from global trends, and what are the reasons for this alignment or divergence?

- In cases of natural disasters where ground-based infrastructures might be compromised, what plans are in place to ensure consistent connectivity in such scenarios?

Our own reflection has led us to believe that LEO satellite technology cannot be overlooked in answering these probing questions. As NICTA's Public Consultation Discussion Paper openly acknowledges, LEO satellite systems deliver broadband and other services to rural and remote areas at lower costs than terrestrial services can, while the equipment is easily transported and installed. Our extensive experience in the Papua New Guinea technology landscape has led us to view SpaceX's Starlink satellite system, in particular, as the most cost-effective technological development available to help us realise the goal of connecting all Papua New Guineans to reliable internet. Specifically, we have identified the following areas where we believe LEO satellite services will foster the greatest benefits:

- Enhancing Education: LEO satellite services will unlock online resources for students and educators to empower distance learning, access educational resources, as well fostering global collaborations.

- Boosting Healthcare Services: Internet allows access to telemedicine initiatives, as well as increased training for healthcare staff.

- Facilitating Economic Growth: The global digital economy requires reliable internet, and without it, PNG will not attract the investment it seeks.

- Supporting Emergency Services and Enhancing Resilience in Emergencies: Reliable communication is vital to emergency services and the current infrastructure is failing to deliver the necessary channels for emergency services to fulfill their functions.

- Closing the Gap: The implementation of LEO satellite services will equalise opportunities to access the internet to all Papua New Guineans.

Concerning the fourth point just raised, the Asian Development Bank has noted the resilience of the Starlink system in maintaining communications during natural disasters such as volcanic activity and earthquakes over older vulnerable systems, which it believes to be a key consideration for the implementation of Starlink in the Asia-Pacific region.[i]

While each of the foregoing points could be discussed in detail, we would like to especially draw your attention to the last one, as this will allow us to more clearly express our concerns with NICTA's proposed changes. As you would be aware, the Executive Council of Papua New Guinea developed and published its long-term vision for the Nation in 2007, The Papua New Guinea Vision 2050. In line with its goal "to bridge the digi[9]tal and technology divide," the long-term vision expresses the hope for a satellite technology network to solve the emerging digital divide that threatens the long-term prosperity and stability of Papua New Guinea. In addition, The Papua New Guinea Development Strategic Plan, published in 2010, sets out the strategies the Nation will utilise over a twenty-year period to realise the goals of Vision 2050. "Wherever the extension of phone, internet and media services is less viable, public private partnerships will be encouraged," the Development Strategic Plan announces, "An important initiative for the extension of services into rural areas will be to secure satellite access."

While these documents may seem ambitious by speaking in broad terms of the hope for satellite technology to bridge the connectivity divide, the emerging evidence from around the world on the Starlink network in particular speaks to their prescience. "The Starlink satellite project has the potential to have a significant impact on the internet provider service in emerging economies, as it focuses on delivering high-speed, low-latency broadband internet in remote and rural locations globally," a study published in 2023 in *Research in Globalization* concludes, "This can help bridge the digital divide and improve internet access in areas where traditional terrestrial infrastructure is lacking or insufficient."[ii] The introduction of LEO satellite services will also mean greater competition in the services offered in Papua New Guinea, a key goal of the Development Strategic Plan given its advice, "Competition in these areas is crucial to the modernisation of PNG."

Thus, before a conversation can take place on the regulatory framework that should apply to LEO satellite technology, all stakeholders should be on the same page as to what the Nation's goals and strategies are in terms of internet and telecommunication services. Those goals call for the implementation, nurture, and encouragement of new satellite technologies to expand the range of services to those who would otherwise be left in the dark, to bridge the digital divide, and work towards a future where one day all Papua New Guineans can access the internet.

Outlining a Licensing Scheme that Aligns with the Nation's Stated Goals and Strategies

In due respect to Papua New Guinea's long-term goals and strategies, we propose a stride towards a digitally inclusive future. The proliferation and adoption of LEO satellite systems presents unique challenges for our nation, but one we believe can be overcome by sensible regulation. To ensure that the adoption of this technology aligns with our national objectives, especially concerning the affordability and promotion of internet services, we propose a structured system whereby in-country ISPs will be licensed to procure and distribute these LEO

satellite systems.This contrasts with the proposed measure to license LEO satellite network providers directly, which we believe lacks feasibility in the small PNG market. By licensing local ISPs, NICTA will have to reconsider the set of licensing conditions that would apply in this case, not to dissuade ISPs from taking an active role in investment and therefore the uptake of this technological solution to the PNG's goals.

1. The Challenges with No Licensing:

    a) Legal: In line with your Public Consultation Paper, we share NICTA's view that LEO satellite services constitute networks as defined in Section 49 of the *National Information and Communication Technology Act 2009* and consider it appropriate for all LEO satellite services to be licensed in some form.
    b) Disequilibrium in the Market: The current state of affairs promotes the adoption of LEO satellite services by only certain market segments, such as credit card holders, altering the distribution of customers using terrestrial internet technology. This in turn will alter the pricing structure of these internet services to compensate for the loss, which may make standard internet services unaffordable at the same time as limiting access to LEO satellite systems. This is contrary to the goals of the Nation we have outlined in terms of internet availability.
    c) Additional factors outlined in your Discussion Paper: These included concerns with fairness in the market, missed revenue, regulatory compliance issues and consumer protection and recourse.

2. The Challenges of Licensing LEO Satellite Network Providers directly:

    a) Feasibility with Direct Network Licensing: Licensing Network Providers, for example SpaceX, presents jurisdictional challenges due to their non-presence in the country, complicating regulatory oversight. We regard it as unlikely that an LEO satellite provider such as SpaceX would establish a corporate presence in the country.
    b) Distorted Market: While current internet service providers offer services with wide ranging payment options, direct purchasing of LEO satellite services require payment methods that lie outside of most people's means. This means that effectively the same market distortions will exist as in a system of no licensing.

3. The Proposed Solution of Licence In-Country ISPs

    a) Structured Distribution System: By allowing ISPs with a corporate presence in PNG to procure and distribute LEO satellite systems, we can ensure a more structured and regulated deployment of the service. This approach will allow us to maintain standards, monitor quality, and most importantly, ensure equitable pricing.

b) Consistent Regulatory Oversight: ISPs, already subject to national regulations, can be more effectively monitored, ensuring adherence to set standard and pricing guidelines.
c) Revenue Generation: We suggest charging a licensing fee of 1000 Kina yearly (per terminal) in advance for the provision of Starlink terminals, revenue which must be reinvested in digital ground infrastructure projects, further benefiting the populace. (Also considerer exemptions for education and health)
d) A public database of sites can easily manage terminals and the collection of licensing fees. (see ACMA sample attached.)

4. Concerns with proposed licensing conditions:

a) Mandatory Coverage Obligations, Network Performance and Repair Obligations: Low Earth Orbit satellite networks are inherently different from terrestrial networks. Its performance metrics are influenced by different factors, including satellite transits and atmospheric conditions. The transferral of licensing from the direct LEO satellite network supplier to local ISPs must account for this.

b) Placement of LEO services under the Universal Access and Service Scheme: LEO satellite services are designed to provide global coverage, especially benefiting regions where terrestrial networks are inefficient or non-existent. Imposing additional universal access obligations might be superfluous as the service inherently promotes universal access. The costs associated with the Universal Access and Service Scheme would increase prices for consumers, who would disproportionately be those who the the Universal Access, counteracting the Scheme.

We realise that this proposal necessitates a redrafting of licensing conditions that is appropriate to this technology and to this model of licensing, one that reflects the Nation's ambitious overall goal of greater telecommunications connectivity. We acknowledge the need for a thorough evaluation of the implementation of this technology through regulatory, environmental, and social lenses, and believe that the collective efforts of NICTA and other stakeholders will lead to an approach that will work for all. This submission paper of ours therefore represents only an initial beginning in a larger conversation. We stand ready to be a part of this process if called upon for consultation, or to offer further advice.

Towards the Future

Our common objective is to ensure that every Papua New Guinean will enjoy reliable internet connectivity, fostering a new age of inclusivity and progress. We are moving forward into the digital age at an unprecedented rate, and the future of Papua New Guineans rests in the hands of your stewardship in keeping the Nation ahead of the curve in these matters, and we therefore appreciate your careful consideration of the perspective we have put forth here and eagerly anticipate that this submission will contribute to an open and constructive dialogue between all parties concerning the implementation of this technology.

It is our hope that NICTA will approach this matter with careful deliberation, balancing the potential benefits and challenges, and will be open for a dialogue with stakeholders.

Best Regards,

Keith Anderson

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[i] https://www.adb.org/news/features/five-ways-low-earth-orbit-satellites-impact-asia-pacific

[ii] Shaengchart, Yarnaphat & Kraiwanit, Tanpat. (2023). Starlink Satellite Project Impact on the Internet Provider Service in Emerging Economies.

[iii] Grajek, Michal and Röller, Lars-Hendrik, Regulation and Investment in Network Industries: Evidence from European Telecoms (June 15, 2009). ESMT Working Paper No. 09-004.

Below a small sample ACMA public Terminal license list in Australia that has around 100,000 Starlink terminals.

Sites where within 100km of Latitude: -31.998258, Longitude: 141.441058

Results **1 - 100** of **183** possible matches.

Site ID	Name	City	District	State	Postcode	Asgn	Site KML	HCIS Level 2	Dist
10021787	SpaceX Satellite ES (GSN#56) BROKEN HILL	BROKEN HILL		NSW		20	[KML]	JV3N	
10009513	MPC Site 3 off Silver City Hwy BROKEN HILL	BROKEN HILL		NSW		2	[KML]	JV3N	1.12km bearing 69.7°
9015495	Perilya Mines Concentrator Loadout Facility BROKEN HILL	BROKEN HILL		NSW	2880	2	[KML]	JV3N	1.36km bearing 14.2°
11472	Metallurgical Research BROKEN HILL	BROKEN HILL		NSW	2880	2	[KML]	JV3N	1.42km bearing 358.6°
500334	Perilya Broken Hill Limited NBHC BROKEN HILL	BROKEN HILL		NSW	2880	6	[KML]	JV3N	1.42km bearing 20.8°
500372	Perilya Broken Hill Limited South Mine Cottage 54 BROKEN HILL	BROKEN HILL		NSW	2880	2	[KML]	JV3N	1.84km bearing 30.0°
10004031	Broken Hill Pinnacles Road BROKEN HILL	BROKEN HILL		NSW		22	[KML]	JV3N	1.95km bearing 310.6°
132295	Shin Satellite Earth Station site BROKEN HILL	BROKEN HILL		NSW	2880	21	[KML]	JV3N	2.13km bearing 324.4°
205840	Pinnacles Road BROKEN HILL	BROKEN HILL		NSW	2880		[KML]	JV3N	2.39km bearing 303.5°
10007281	Electrical Substation 76 Pinnacles Road Broken Hill	Broken Hill		NSW		8	[KML]	JV3N	2.43km bearing 302.9°
11516	Sub-Station off Pinnacles Road BROKEN HILL	BROKEN HILL		NSW	2880		[KML]	JV3N	2.51km bearing 301.2°
11438	RFDS Hangar Airport BROKEN HILL	BROKEN HILL		NSW	2880	2	[KML]	JV6B	2.63km bearing 92.8°
9008856	Airport Lighting Room Broken Hill Airport BROKEN HILL	BROKEN HILL		NSW	2880	8	[KML]	JV3N	2.66km bearing 89.7°
9010126	Airservices Australia Site Bonanza Street BROKEN HILL	BROKEN HILL		NSW	2880	1	[KML]	JV3N	2.68km bearing 75.0°
11508	MMM Headframe BROKEN HILL	BROKEN HILL		NSW	2880	6	[KML]	JV3N	2.69km bearing 29.6°
10029109	Broken Hill Airport Terminal Pro Hart Way BROKEN HILL	BROKEN HILL		NSW		2	[KML]	JV6B	2.76km bearing 91.5°
502457	CMTS site off Gypsum Road BROKEN HILL SOUTH	BROKEN HILL SOUTH		NSW	2880	30	[KML]	JV3N	2.87km bearing 25.8°