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Shri Syed Tausif Abbas, Advisor
(Networks, Spectrum and Licensing)
Telecom Regulatory Authority of India

OneWeb Input to Consultation Paper
Licensing Framework for Satellite-based connectivity for low bit rate applications

Honourable Sir,

OneWeb welcomes the opportunity to participate and contribute to the consultation on Licensing Framework for Satellite-based connectivity for low bit rate applications.

OneWeb is a global communication company with a mission to bring high-speed, low-latency satellite broadband connectivity to everyone everywhere, even the most remote and disconnected areas, using the new technology of Low Earth Orbit (LEO). OneWeb believes that satellite systems have a key role to play in a multi-network broadband ecosystem, often in a complementary way to terrestrial telecommunication solutions.

OneWeb would like to commend the Telecom Regulatory Authority of India (TRAI) for this precious work of reviewing this particular licensing framework. Satellite based connectivity has evolved drastically over the past years, especially with the introduction of LEO constellations such as OneWeb, that will be able to provide low latency, high-throughput connections not available previously. An updated, more adequate licensing framework is indeed needed for to enable the space-based communications systems develop to its full capability to serve then Indian market.

Attached to this letter, OneWeb respectfully submit its comments on the specific questions and is committed to support and work with the TRAI to provide any further information required. Please do not hesitate to contact us if you would like to discuss the content further.

Yours truly,



Christopher McLaughlin

Chief of Government, Regulatory Affairs and Engagement
OneWeb Communications Ltd

Comments from OneWeb to Questions Raised by TRAI

- Q1. There are two models of provision of Satellite-based connectivity for IoT and low-bit-rate applications – (i) Hybrid model consisting of LPWAN and Satellite and (ii) Direct to satellite connectivity.**
- i **(i) Whether both the models should be permitted to provide satellite connectivity for IoT devices and low-bit-rate applications? Please justify your answer.**
- ii **(ii) Is there any other suitable model through which the satellite-based connectivity can be provided for IoT devices? Please explain in detail with justifications.**

The connectivity revolution powered by Internet of Things is one of the most important trends in modern technology and is set to transform countless industries. It is essential that governments provide a regulatory framework that facilitates the development and growth of IoT, and does not impose service or technological restrictions that hold back innovation. There is no one-size-fit-all technology that can satisfy requirement of all the IoT applications.

That said, most IoT applications need a low cost, low powered and low maintenance solution, which could be deployed both indoor and outdoor, for this, we believe a hybrid model of satellite and LPWAN will be more adequate for most scenario. Satellite operator will provide the backhaul functionality and LPWAN is used to deploy last hop or last mile connectivity to the IoT devices. This will ensure the IoT devices to remain low powered and affordable, and can be deployed ubiquitously both indoor and outdoor.

Direct to Satellite connectivity would serve in cases where there is no possibility to deploy a terrestrial LPWAN, or in case of natural disaster monitoring and response.

- Q2. Satellite-based low-bit-rate connectivity is possible using Geo Stationary, Medium and Low Earth orbit Satellites. Whether all the above type of satellites should be permitted to be used for providing satellite-based low-bit-rate connectivity? Please justify your answer.**

Satellites already play significant roles in today's connectivity, and all type of satellites will have different characteristics. New generation of LEO satellites, such as OneWeb's, will be able to provide low latency (<50msec delay round trip on RF paths), high-throughput connections to any spot on the globe. OneWeb's satellite service will be supported by innovative low-cost user terminals that can provide 3G, 4G LTE, 5G and LPWAN connectivity, thus bringing high-speed access to surrounding areas of a satellite terminal and extend coverage of a terrestrial network.

Q3. There are different frequency bands in which communication satellites operate such as L-band, S-band, C-band, Ku-band, Ka- band and other higher bands. Whether any specific band or all the bands should be allowed to be used for providing satellite-based IoT connectivity? Please justify your answer.

OneWeb believes the satellite connectivity should be band-agnostic, and any spectrum bands allocated for Fixed Satellite Service or Mobile Satellite Service in India as per the NFAP-18 should be available for this use. In this regard, we would like to inform TRAI that OneWeb is operating in Ku band (10.7-12.7 GHz and 14-14.5GHz) for its user terminals and Ka band (17.8-18.6, 18.8-19.3GHz and 27.5-29.1, 29.5-30 GHz) for its gateway on global basis, and we applied for the license to operate in those bands in India. We would there like to request TRAI to preserve those bands for FSS use only.

OneWeb confirms the importance of the Q and V bands to the future generation of its satellite services, especially for gateway communications (37.5-43.5 GHz, 47.2-50.2 GHz, and 50.4-51.4 GHz).

Q4 (i) Whether a new licensing framework should be proposed for the provision of Satellite-based connectivity for low-bit-rate applications or the existing licensing framework may be suitably amended to include the provisioning of such connectivity? Please justify your answer.

(ii) In case you are in favour of a new licensing framework, please suggest suitable entry fee, license fee, bank guarantee, NOCC charges, spectrum usage charges/royalty fee, etc.

OneWeb believes a new licensing framework is required especially for reflecting the latest technological advances made in the Non-Geo Stationary Orbits satellites Non-Geostationary (NGSO) Satellite systems.

Currently spectrum for gateway are licensed per antenna, such an approach has impeded the development of NGSO systems owing to the imposition of onerous fees on the operation of the multiple antennas required for certain NGSO ground systems such as gateways. Licensing earth stations that comprise a structured array of antennas as a single antenna would be more aligned with the opportunity cost of spectrum, for which a co-located array of antennas, using the same frequencies, does not deny more spectrum from other users than a single antenna would. This gateway licensing approach has been adopted in many countries around the world. For example, the US considers that “Multiple antennas in an NGSO FSS gateway earth station complex located within an area bounded by one second of latitude and one second of longitude may be regarded as a single earth station for purposes of coordination with terrestrial services.”

We would also like to see a provision for generic or blanket licensing for VSAT and ESIM within the FSS for satellite applications. An adoption of national regulatory regimes that consider generic or blanket licensing would greatly simplify the administrative burdens of government, operators, service providers, and users

alike. European administrations for example, through several ECC Decisions¹, have adopted a set of technical and operational principles for blanket licensing that eliminate the need for individual licensing of two-way earth stations, whether for fixed or mobile applications.

Q5. The existing authorization of GMPCS service under Unified License permits the licensee for provision of voice and non-voice messages and data services. Whether the scope of GMPCS authorization may be enhanced to permit the licensees to provide satellite-based connectivity for IoT devices within the service area? Please justify your answer.

OneWeb believes the Low Bit Rate connectivity for the IoT devices are a subset of the data services and is already included in the scope of GMPCS authorisation. It is however desirable for TRAI to update the scope of GMPCS to clarify this inclusion.

Q6. Commercial VSAT CUG Service authorization permits provision of data connectivity using VSAT terminals to CUG users.

i **(i) Whether the scope of Commercial VSAT CUG Service authorization should be enhanced to permit the use of any technology and any kind of ground terminals to provide the satellite-based low-bit-rate connectivity for IoT devices?**

ii **(ii) Whether the condition of CUG nature of user group should be removed for this authorization to permit provision of any kind of satellite-based connectivity within the service area?** Please justify your answer.

As above, OneWeb believes the Low Bit Rate connectivity for the IoT devices are a subset of the data services, and therefore is already included in the scope of VSAT service authorisation. It is however desirable for TRAI to update the scope of VSAT to clarify this inclusion.

A technology neutral approach to the authorisation is key to enable future technological advance and competition.

Q7. (i) What should be the licensing framework for Captive licensee, in case an entity wishes to obtain captive license for using satellite-based low-bit-rate IoT connectivity for its own captive use?

¹ [ECC/DEC/\(15\)04](#), [ECC/DEC/\(19\)04](#), [ECC/DEC/\(03\)04](#), [ECC/DEC/\(05\)09](#), [ECC/DEC/\(05\)10](#), [ECC/DEC/\(05\)11](#), [ECC/DEC/\(06\)03](#), [ECC/DEC/\(17\)04](#), [ECC/DEC/\(13\)01](#), [ECC/DEC/\(18\)04](#), [ECC/DEC/\(18\)05](#), [ECC/DEC/\(12\)01](#), [ECC/DEC/\(06\)02](#)

- (ii) Whether the scope of Captive VSAT CUG Service license should be modified to include the satellite-based low-bit-rate IoT connectivity for captive use?**
- (iii) If yes, what should be the charging mechanism for spectrum and license fee, in view of requirement of a large number of ground terminals to connect large number of captive IoT devices?**

As above, OneWeb believes the Low Bit Rate connectivity for the IoT devices are a subset of the data services, and therefore is already included in the scope of Captive license. It is however desirable for TRAI to update the scope of the Captive license to clarify this inclusion.

Q8. Whether the scope of INSAT MSS-R service authorization should be modified to provide the satellite-based connectivity for IoT devices? Please justify your answer.

Mobile Satellite Service-Reporting MSS-R service is a one way low bit rate, and extremely limited in the throughput of 300 bps. We believe this service is too limited by today's technology standard, even for low bitrate IoT application.

Q9. (i) As per the scope mentioned in the Unified License for NLD service Authorization, whether NLD Service providers should be permitted to provide satellite-based connectivity for IoT devices. (ii) What measures should be taken to facilitate such services? Please justify your answer.

Yes, NLD service providers will be essential to provide connectivity in the hybrid model consisting of satellite LPWAN. In such hybrid model, satellite operator typically provide the backhauling functionality while NLD service provider would provide the last hop/mile connectivity to the IoT devices.

Q10. Whether the licensees should be permitted to obtain satellite bandwidth from foreign satellites in order to provide low-bit-rate applications and IoT connectivity? Please justify your answer.

Yes, allowing both domestic and foreign satellites to provide the satellite bandwidth will ensure that the consumers will benefit from additional offerings, advanced technology, at the most competitive price. Such an Open-sky policy would allow operator such as OneWeb to provide services in India. OneWeb firmly believes that LEO satellite constellation will be able to offer service level not attainable by traditional GEO satellites in terms of throughput, latency, or cost.

Q11. In case, the satellite transponder bandwidth has been obtained from foreign satellites, what conditions should be imposed on licensees, including regarding establishment of downlink Earth station in India? Please justify your answer.

OneWeb would like to humbly submit that foreign operators and domestic operators should be provided a level playing field for healthy competition. Many countries requires establishment of Earth station in country for law enforcement purpose. In this regard, OneWeb would like to inform TRAI that it is planning to have 2 gateways in India.

Q12. The cost of satellite-based services is on the higher side in the country due to which it has not been widely adopted by end users. What measures can be taken to make the satellite-based services affordable in India? Please elaborate your answer with justification.

Retail price, and by association the cost of providing service, is the most determining factor in the consumers adoption of a service. Although additional competition, and technology advance brought by the NGSO systems will lower the consumer price, for satellite based service, the cost associated with providing service in a particular market are: license authorisation fees, spectrum charge, and custom taxes for user terminal and equipment. In order to promote adoption, Government of India should assess the level of these three elements and define the level of levies to a pure cost recovery basis.

It should also be noted that regarding spectrum fees, satellite operators would really benefit from a special spectrum fees formula for gateways operating several antennas using the same spectrum. As such operation requires huge bandwidth, but the spectrum is only assigned for a particular location only and the spectrum denial is not bigger using several antennas versus a single antenna.

Q13. Whether the procedures to acquire a license for providing satellite-based services in the existing framework convenient for the applicants? Is there any scope of simplifying the various processes? Please give details and justification.

The process should be simplified and provide a one-stop shop for the license application. The government agencies responsible for the various part of the license should come together and provide an unique interfece to the applicant. A clear processing timeline should be defined and communicated to the applicants.

Regarding VSAT, a blanket license regime should be considered to. An adoption of national regulatory regimes that consider generic or blanket licensing would greatly simplify the administrative burdens of government, operators, service providers, and users alike. Other countries have pushed this notion even further by delicensing completely certain band, New Zealand for example, offer the possibility to operate user terminals under the GURL² license, as long as the terminals operate within the technical parameters defined by the GURL license.

Type approval of user terminals should be streamlined and not create unnecessary huddle. For this, many countries recognize ETSI standards. In this regard, OneWeb satellite system and the related satellite Earth stations, fixed stations and the Earth Station In Motion are and will comply European decisions ECC Decision (17)04³, ECC Decision (18) 05⁴, the Radio Equipment Directive⁵ and ETSI Harmonized Standard EN 303 980^{6,7}

Q14. If there are any other issues/suggestions relevant to the subject, stakeholders are invited to submit the same with proper explanation and justification.

None

² <https://www.rsm.govt.nz/licensing/frequencies-for-anyone/satellite-services-gurl/>

³ ECC Decision (17)04, <https://docdb.cept.org/download/89ca1a89-b33c/ECCDEC1704.pdf>

⁴ ECC Decision (18)05, <https://docdb.cept.org/download/a885e3f1-0c26/ECCDec1805.pdf>

⁵ Radio Equipment Directive, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0053&from=EN>

⁶ ETSI EN 303980, https://www.etsi.org/deliver/etsi_en/303900_303999/303980/01.01.00_20/en_303980v010100a.pdf

⁷ Version 2 of this ETSI EN 303980 is currently in public enquiry and expected to be published on the Official Journal of the EU by end of 2021.