

Friday, April 9th, 2021

Subject: Response to Consultation Paper

Dear Mr Shri Syed Tausif Abbas,

First and foremost, I would like to thank TRAI for giving the opportunity to comment and contribute to such an important topic.

I am very pleased to hereby attach OQ Technology views and comments regarding the questions raised by TRAI in the Consultation Paper on “Licensing framework for Satellite based connectivity for low bit rate applications” published by TRAI.

We look forward to the next steps of the process and we remain at your disposal should have any questions.

Regards,

geprüft: C/ Dufoing



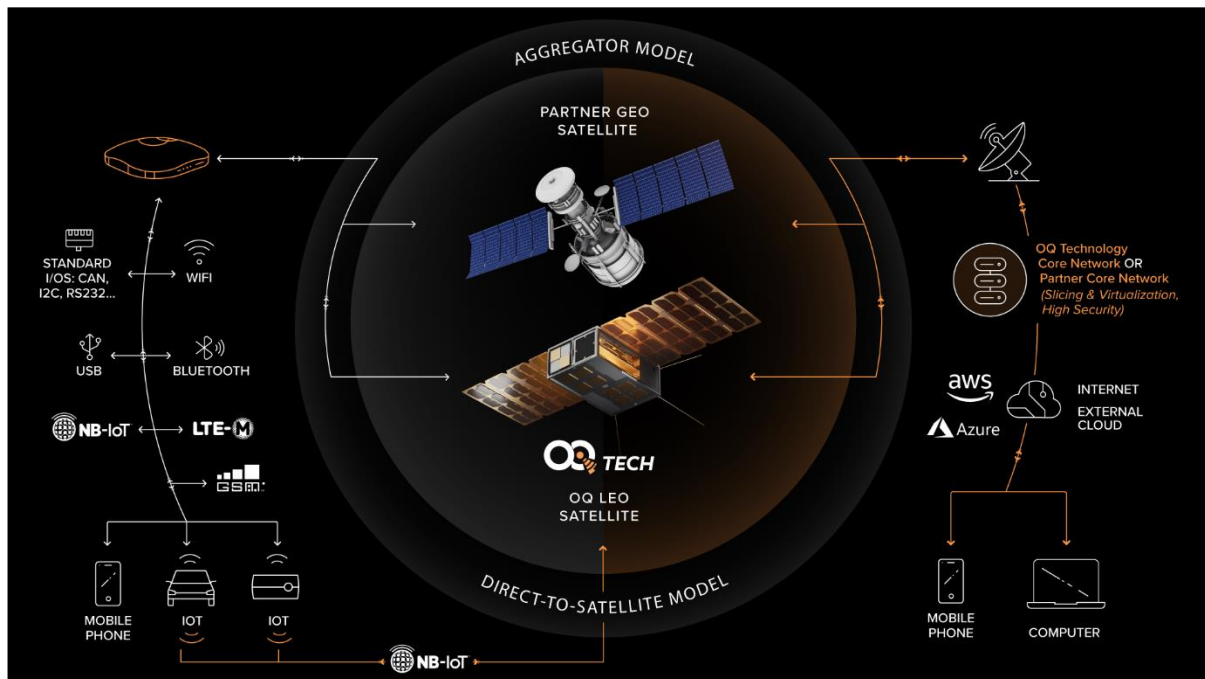
Cyril Dufoing,
Technical Program Manager
(On behalf of Omar Qaise, CEO & Founder of OQ Technology)

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) Whether both the models should be permitted to provide satellite-based connectivity for IoT devices and low-bit-rate applications? Please justify your answer.

OQ Tech is a strong believer in interoperability and has developed its business model and hardware to offer the best of the two worlds.

In the very first days of Satellite IOT, OQ tech expects most of connections will be through the aggregator model also referred to as hybrid model in this consultation. In that instance the Oq tech terminal will act an gateway and enable thousands of existing and heterogeneous sensors (whether they are Wifi, Bluetooth, wired, or using proprietary waveform) to connect to the satellite. Further down the road, satellite-IoT-enabled sensors will be deployed and will ensure a seamless transition to more and more Direct to satellite type of connectivity in the IoT world.



From a satellite-service regulations perspective, it actually does not really matter. There is a common denominator between the hybrid model and the direct to satellite model: the user link. Whether it is in aggregator mode or direct to satellite mode, that very link from the user(s) on the ground to the satellite in space is a satellite IoT connectivity which could be described as low power, low bit rate and low duty cycle.

Not only OQ Tech is of the view that both models should be permitted but OQ Tech strongly believes that both models should be subject to the same regulatory regime to allow the use of the one or the other in a transparent regulatory fashion.

(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

OQ Tech reckons the above models cover 100% of the possible cases and needs, and does not anticipate any other satellite-based connectivity.

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

As mentioned above, one of OQ Tech main considerations is to offer highly interoperable. As such connectivity to different type of satellites (LEO, MEO, GEO) has been of the utmost importance throughout the design of the system and the terminals. However OQ Tech would like to draw TRA attention to some systems referenced in Table 3.

Undoubtedly LEO, MEO and GEO have the capabilities to provide IoT service and each of them will play a crucial role providing IoT services.

However, while Satellite-based IOT is characterized by a low-power, low-data rate (and so low bandwidth), small form factor and low directivity antennas, some of the systems listed in the table are primarily designed for broadband applications and require large amount of spectrum together very directive antenna and (relatively) high power in order to deliver the required services.

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.

Frequency bands are normally allocated to a type of service and are technology neutral. Depending on the nature of the end users (mobile or fixed), Satellite-based IoT connectivity would fall within the definition of either Mobile Satellite Service or Fixed Satellite Service.

However one frequency band stands out of the crowd. Indeed the S-band has a unique status whereby it's allocated to Mobile Satellite Service on a global basis and is also shared on a primary status with Fixed service and Mobile service. This provides the unique opportunity to offer improved interoperability between space and ground networks while not over complexifying the ground segment or the space segment, and making the most efficient use of the spectrum.

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.

OQ Tech invites TRAI to consider the technological and economic characteristics of IoT services when looking into the regulatory provisions, and welcomes an efficient and light touch

As IoT use low power terminals, they can effectively and efficiently share the spectrum resources. OQ Tech does not believe a spectrum license (where exclusive use is given to the licensee) would enable the true potential of IoT and not inhibit the anticipated growth trajectory of IoT adoption rate. Also, given the potential high number of terminals and the relatively low revenue per terminal, it is also OQ Tech's preference to have a blanket licensing approach with the IoT devices exempt from individual licensing in order to reduce the associated cost (and paperwork) and reach the mass market.

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.

OQ Tech is of the view that the very novel nature of IoT (more specifically on the S-band) should be captured in a new regulatory framework. The antenna size, the technical characteristics and capabilities of IoT systems in the S-band are very different from those of GMPCS systems at the time they were introduced. Furthermore the GMPCS authorization carry some obligations and requirements which would put some undue constraints on the deployment of IoT.

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

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

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

For those IoT systems that (will) operate in the Ku-band and/or the Ka-band which could be likened to VSAT operating at low bitrate, it might be possible to envisage a regulatory framework based on enhancing existing provisions.

- 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?**
(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?

For the same reasons as mentioned in Question 5, the use of captive network should be captured in a new regulation. For ease of deployment and considering the economic aspects of IoT, OQ Tech strongly supports the exemption from individual licensing for the terminals.

It is commonly perceived that the most appropriate mechanism to resolve competing demand is a price-based allocation mechanism via auction. While this might be true for the terrestrial networks, OQ Tech believes such mechanism does not have any benefits in making the best use of the satellite spectrum. Instead this might result in establishing monopolies, warehousing spectrum and limiting competition to a few players. Although not a competing auction per se, the 2GHz MSS selection process in EU in granting all available spectrum to only two actors has proven anti-competitive and not very effective and has prevented many newcomers from entering the band.

- 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.**

Again the very specific nature of the IoT services in comparison with the one-way INSAT MSS-R would make it difficult to use the existing regulatory framework as the baseline for a new regulations.

- 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.**

- 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.**

As highlighted in the consultation, there are currently a lot of IoT operators in the market or about to enter the market. Allowing foreign operators to provide satellite bandwidth in India will definitely serve the public interest by not only fostering the competition, but also stimulating investment and innovation.

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.

OQ Tech is of the view that the mandatory establishment of an Earth station in India is likely to create undue constraints.

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.

The high price point observed in certain countries/regions is primarily driven by the many barriers to entry and the consequent lack of competition. By allowing foreign operators to provide services in India and by keeping the barriers to entry at the lowest level (and by keeping licensing fees low), India will unleash the true potential of IoT and will allow a cost-efficient mass market deployment.

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

OQ Tech shares the views that a one-stop shop with access through an online portal will simplify the process and might ultimately attract more players for an even growing competition.

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