



SKYLOTECH INDIA PVT. LTD.

Dated 14.04.2021

To

**The Advisor (NSL-II),
Telecom Regulatory Authority,
Mahanagar Doorsanchar Bhawan,
Jawahar Lal Nehru Marg,
New Delhi – 110 002**

Sub: Comments on TRAI Consultation Paper on Licensing Framework for Satellite-based connectivity for Low bit rate applications

Dear Sir,

With reference to TRAI Consultation Paper dated 12th March 2021, on Licensing Framework for Satellite-based connectivity for Low bit rate applications, we are pleased to submit our comments on the various consultation issues, as per the attached document.

A handwritten signature in black ink, appearing to read "Angira Agrawal", with a horizontal line underneath.

**(Angira Agrawal)
Chief Operating Officer**

Sub: Comments on TRAI Consultation Paper on Licensing Framework for Satellite-based connectivity for Low bit rate applications- From M/s Skylotech India Pvt. Ltd.

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 (ii) Direct to satellite connectivity.

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

Ans: Yes, both the models should be permitted.

IoT networks, either satellite or terrestrial, should not be considered any differently. The world is moving towards convergence of satellite and terrestrial standards, as well as cost and accessibility.

The needs of customers in IoT are extremely dynamic and fast-moving. The pace of innovation in this sector is also incredibly fast. Therefore, innovation in our country and adoption of new standards should be encouraged for IoT applications of all forms to truly make connectivity affordable and accessible to all.

Companies may offer a hybrid mode of connectivity for say, a farm, where local soil sensors interface over LPWAN with an intermediate node, which then backhauls traffic over satellite to the Gateway. Alternatively, a connected vehicle may only require 1:1 (direct to satellite) connectivity. This flexibility is key to help entrepreneurs find the best way for customers to be connected and transport data affordably.

(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.

Ans: A VSAT connected to a gateway at a wind-farm, for example, which has wired sensors / devices connected to it is an example of an IoT application that is neither direct-to-satellite nor LPWAN. This is the case today, for instance, where wind turbines are daisy chained through fibre optic cables and the data is then aggregated at a VSAT for backhaul. Similarly, a remote mobile tower itself may also leverage satellite connectivity as backhaul to offer IoT services terrestrially.

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.

Ans: Yes, all types of satellites may be permitted making the connectivity technology neutral.

Different applications might need use of different satellite configuration. Flexibility in this regard would permit the satellite operating companies to come up with various innovative approaches.

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.

Ans: All the frequency bands may be permitted making the connectivity spectrum neutral. It may be noted that MSS satellite bands (L & S) are best suited for low bit-rate connectivity). The satellite service provider should be allowed flexibility on end use-cases to monetize their spectrum, so long as their system conforms in frequency bands as per India's licensing regime / NFAP and ITU RR allocations. The role of global coordination of frequency bands is primarily to help prevent harmful interference. So long as the frequency plan does not cause harmful interference to other systems, it should be permitted to be coordinated.

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.

Ans: The communication characteristics of machines and sensors are very different than human-centric networks -- lower bit-rate, less stochastic, requiring a quicker deployment in remote areas. A new 'light touch' regulatory / licensing framework may be considered for satellite-based low-bit-rate applications, consistent with the licensing framework for any IoT service (whether satellite or terrestrial). Satellite communications should be viewed holistically together with the nation's strategy for digital communications overall. Satellite and terrestrial communications cannot be decoupled, and the regulator should be technology agnostic. DoT may consider terrestrial and satellite IoT networks under a common technology agnostic framework, without discrimination of any one type of technology, whether satellite or terrestrial. The approval and certification process for satellite data services (inclusive of IoT) may be carried out under a single window clearance mechanism under the DoT. The Department of Telecom (DoT) is already the authorized body of Government of India for issuing license & approval of all types of communications services, including satellite communication. DoT has recently formed a separate Satellite Cell for dealing with Satellite Communications. The Wireless Planning and Coordination (WPC) Wing, is also functioning under the administrative control of DOT. WPC is the authorized representative of India to the ITU for all satellite coordination matters. The TEC may have a dedicated wing for rapid approval of satellite devices and IoT devices, apart from mainstream telecommunication services, to help bolster the satellite IoT sector.

(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.

Ans: A new set of licence conditions, including financial aspects, would be needed for narrow band IoT type systems, as many of these systems may be initiated by

start-ups that require handholding and their scarce resources are better suited towards the actual innovation and buildout of a new network. The large amount of bank guarantee, NOCC charges, etc. for licenses today may not be viable for such systems which are primarily designed to be as low-cost as possible on a per-user basis, and may have a much longer gestation period than consumer services given that the customers are primarily enterprises. The USOF levy may be reduced from the percentage of license fees as these services are mainly meant for remote areas. The entry costs or up-front costs could be reduced, possibly waived.

When calculating the Adjusted Gross Revenue (AGR) for the purpose of assessing the license fee & spectrum usage charge, the cost of the equipment sold (hardware/user terminals) and the cost incurred by licensee in case of leasing satellite transponder capacity, may be deducted from Gross Revenue.

Proposed fee structure, consistent with IoT/M2M services is given below:

Application Fee	Entry Fee	FBG	LF*	SUC	NOCC Charges
Rs. 5000/-	Rs.2,00,000/-	Rs. 5,00,000/-	3 %	1 %	Nil

*Note: The license fee may not include the USOF levy, as these services are mainly for remote areas.

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.

Ans: While a broad interpretation of the GMPCS service under Unified Licence (and suitable changes) covers IoT applications as well, we have proposed a new 'light touch' licensing framework for IoT Services as mentioned in response to question 4.

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 any kind of ground terminals to provide the satellite-based low-bit-rate connectivity for IoT devices?

Ans: We have proposed a new 'light touch' licensing framework for IoT Services as mentioned in response to question 4.

(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.

Ans: No comments

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?

Ans: No comments

(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?

Ans: Same as for part (i) of this question.

(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?

Ans: Same as for part (i) of this question.

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.

Ans: MSS-R is a separate authorization for one way messaging service, and was created at a time when IoT didn't exist in its current form. For IoT, a separate 'light touch' license / authorisation is proposed. As per DOT website, against MSS-R, only one license has been issued by DoT till date and that is also inoperative due to non-issue of space segment. Hence, there is a need to have a new framework that considers Satellite based connectivity for IoT services.

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.

Ans: The NLD service authorization is basically for carriage, and not for reaching the end customer / user directly, which is part of Access Service authorization. Hence, NLD operators may be asked to obtain separate authorization/license for this service.

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.

Ans: Yes, the licensee may be permitted to obtain satellite bandwidth from foreign satellites. India requires development of affordable connectivity for all remote areas. Supply & demand forces will ensure that the consumers always have access to the most reliable form of connectivity at the cheapest cost. The regulator has previously taken note of the benefits of an open-skies policy, so long as the relevant data privacy and security aspects are met by the licensee. A liberal regime in this regard would be helpful. This would allow the IoT service providers to adopt various innovative approaches to benefit the country and drive greater investment into the country for innovation and growth.

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.

Ans: In such a case, the licensee may be asked to set up a satellite gateway within India for accessing the services provided in India. This will ensure that data resides in India concurrent with domestic policy, and LIS/LIM protocols can be implemented.

The LIS/LIM protocols themselves may be appropriately considered to be lighter touch vs. broadband / other types of networks. The approval and execution of Earth stations in India may become a bottleneck for companies wanting to establish novel networks in India, and thus the respective approvals from NOCC and DoT for Earth station setup may be fast-tracked once the license is conditionally approved.

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.

Ans: The satellite based services in the country are in a similar situation today, as the cellular services were around 1998, prior to the sector being liberalized. Liberalization plus a level playing field for private competition created by the regulator resulted in sharp reduction in tariffs and extraordinary growth of cellular telephony in the country. A similar liberal approach for all satellite based services is needed now. This would reap tremendous socio-economic benefits for the country.

The following measures may be taken to make the satellite based services affordable.

- a) A liberal, 'light touch' approach may be considered for approval and fast-track of satellite-based services, under a time-bound single-window clearance mechanism residing within the DoT.

It is essential to note that satellite services have the benefit of velocity -- blanket coverage can be provided at a fraction of the cost and time as compared to terrestrial services. However, license approvals typically take months if not years -- and to this date, there is no licensed private satcom operator from India. A level playing field must be created by empowering DoT with a single-window clearance mechanism for all satcom services, enabling fast-tracking of all types of satellite service licenses as and when requested. This will help ensure that the cycle of innovation commences in our country and continues to keep India ahead in reducing the cost of satellite-based services.

- b) Service providers may be permitted to lease satellite transponder bandwidth from domestic or foreign satellite operators directly (open-sky policy).
- c) Satellite capacity lease charges may be deducted from the gross revenue for calculating AGR for the purpose of the spectrum usage charges and license fees.
- d) The Spectrum Usage Charges (SUC) on AGR basis should be capped at 1%.
- e) The Licence fee may not include the USOF levy, as the services will be mostly utilised in remote areas.
- f) Entry charges, such as bank guarantees and NOCC charges may reduce to a very nominal amount or waived (refer Section 4).
- g) The cost of UTs and satellite bandwidth charges to be realised from customers may be excluded from the Gross Revenue while calculation of AGR, as these are of pass-through nature.
- h) Import/export and sales of satellite UTs should be liberalized for all licensed and permitted services. This will spark domestic manufacturing as well, support local distributors, and draw FDI while also making India export-competitive.

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.

Ans: As evidenced by the lack of any successful license-holder, the existing framework does not provide the applicant a clear process or a single-window clearance mechanism. The present procedure for acquiring a licence for satellite based services is extremely involved, with multiple different Departments of the GoI, resulting in a time and resource consuming process. Licensing of satellite-based services needs to be simplified to a great extent, brought under a single-window

clearance mechanism under the DoT, monitored by TRAI for transparency, and made time-bound, for exponential growth of these services.

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

Ans: The following suggestions may be considered to help propagate the growth of the satellite IoT segment:

- a) The guidelines for Lawful interception for IoT services are to be simplified and clarified, keeping in view of the simpler / different nature of service. The existing guidelines of LIM/LIS for ISP/broadband services may not be made applicable for these types of services.
- b) The requirement of Import license for import of user terminals or any other device for providing this service is to be waived-off.
- c) Methodology for AGR calculation to be defined separately by not taking into account the cost of UTs and satellite bandwidth charges to be realised from customers in the AGR (please refer to Section 4).
- d) Certain requirements such as operating license from WPC may be done away with for remote terminals i.e. user devices for low bit-rate applications. Exemption from SACFA clearance for users terminals may also be given.