

**Comments on the Consultation Paper on  
Licensing Framework for Satellite-based connectivity for low bit rate applications**

Submitted By  
Venkata Garapati  
[venkatagarapati14@gmail.com](mailto:venkatagarapati14@gmail.com)

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**To**  
**Shri Syed Tausif Abbas**  
**Advisor (Networks, Spectrum and Licensing)**  
**TRAI**

**Dear Sir,**

**I would like to thank the authority for giving me this opportunity to present my views on the Consultation Paper on Licensing Framework for Satellite-based connectivity for low bit rate applications.**

**Yours Sincerely**  
**Venkat Garapati**  
[venkatagarapati14@gmail.com](mailto:venkatagarapati14@gmail.com)

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**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.**

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

**b. Is there any other suitable model through which the satellite-based connectivity can be provided for IoT devices? Please explain in detail with justifications.**

**Response:**

Both models should be permitted to provide satellite-based connectivity for IoT devices and low-bit-rate applications. It should be left to the operators and service providers to adopt the best possible network topology in terms of availability, continuous coverage and cost. Restricting to a particular topology would hamper the freedom to develop innovative solutions.

Many satellite constellations are specifically designed, with global coverage, for IOT applications. These have been designed keeping specific IoT technical and business requirements in mind, terminals with low power consumption and advanced power-saving modes and innovative, low cost & small size remote antenna to offer. Most of these are designed to provide direct connectivity and can be easily integrated with terrestrial systems to create hybrid networks to best serve the customers at all levels.

**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.**

**Response:**

The IoT ecosystem has different requirements like data types, speeds, latency, volumes and specific regions. Billions of devices are expected to be connected in next 10 years. It is not possible to meet such specific requirements and huge demand with a single type of satellite constellations. Further, many innovative solutions are being developed by NGSO constellation operators. Evolving technology mix would lead to competitive landscape and fuel better penetration and pave way for affordable connectivity.

Satellites in each of GEO, MEO and LEO orbits have distinct advantages like latency, coverage, varying capex and opex. Industry can combine these advantages and support applications with high-density traffic as well as for critical applications where redundancy is required.

Hence, all types of satellites viz. GEO, MEO and LEO, be permitted without any restrictions on any specific type of satellite.

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**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.**

**Response:**

Communication systems in each of these bands have different characteristics. Taking advantage of these characteristics and to support different IOT applications, the ecosystem stake holders have developed innovative products like electronic steerable antennas, compact & power-friendly modems, small antennae and cost-effective solutions to make installation and management easier.

All the frequency bands such as L-Band, S-Band, C-Band, Ku-Band, Ka-Band including MSS band and other Higher bands allowed to be used, without any restrictions, for providing satellite-based IoT connectivity.

**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.**

**Response:**

It is suggested to have a new licensing framework as the existing VSAT, GMPCS and NLD guidelines and fee structure act as a very high entry barrier for new licensees. This would impact the prices of the services to be offered and can severely affect the end users.

The new age digital services need enabling environment including the regulatory framework to spur the innovation and growth. Further, there are many start-ups in this sector developing innovative solutions. To encourage Indian start-ups and make a true Aatmanirbhar Bharat, the licensing fee has to be very affordable for large participation of these start-ups.

Satellite based IOT is set to play key role in diverse areas like Agriculture, Mining, Deep sea etc. There are several applications of Satellite based IOT and major focus is on critical applications like Mission Critical, Healthcare, Agriculture and many emerging ones. Proliferation of satellite IOT in these critical applications as well as other emerging areas will depend on ease of doing business, including low entry barriers.

As it can be seen, relatively low entry barrier in broadcast sector fuelled the phenomenal growth of the sector in the last two decades. The licensing structure can be on the lines of broadcast sector.

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Further, the spectrum royalty charges and NOCC monitoring charges may be revised accordingly to make these services competitive.

Recommended Fee for Satellite Services (Rs in Crore)					
Sr No.	Service Type	Min Net-worth	Entry Fee	PBG	Application Processing Fee
1	Large Entity	5	1	0.5	0.001
2	Start-Up	1	NIL	0.25	0.001

**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.**

**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?**

**(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.**

**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?**

**Response**

Existing licensing framework of GMPCS, VSAT (Commercial and Captive) may be suitably amended for the provision of Satellite-based connectivity, in line with new licensing framework.

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**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.**

**Response:**

The lone licensee under INSAT MSS-R service authorization has not rolled out services and non-operative for quite long time. The INSAT MSS-R license could be combined with a broader licensing scheme for satellite IOT or satellite communications in general.

**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.**

**Response:**

Yes, those NLD Service Providers who have obtained prior clearance from Department of Space should be allowed to provided satellite-based connectivity for 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.**

**Response:**

Licensees should be allowed to obtain satellite bandwidth from foreign satellites in order to provide low-bit-rate applications and IoT connectivity. This should be under open-sky policy to accelerate the deployment of services and growth of the sector. Further, under open sky policy, the service providers can obtain bandwidth at better commercial terms and have long term business plans.

**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.**

**Response:**

Earth Station Gateway should be established in India as per the existing guidelines to route the traffic generated from/to the Indian customers for the security and monitoring purpose.

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**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.**

**Response:**

It is true that the cost of satellite-based services is on the higher side in the country due to which services are not widely deployed. Restrictive policies do not permit market to determine the costs and ultimately delay the deployment of service and hamper the growth of the sector.

Allowing open-sky policy would help in obtaining competitive pricing, access to technological advances and better quality of service.

**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.**

**Response:**

Multiple departments, under different ministries, have to be approached to obtain service license, satellite capacity allocation and network license etc. This considerably prolongs the process of obtaining necessary approvals and delay the launch of services. It is recommended to have a single window approval process.

Applicant should be able to apply to single nodal ministry or agency. For example, Department of Telecom or Department of Space etc. and the remaining permissions like WPC, SACFA, NOCC etc. should be handled at the backend between the departments themselves. The approval or denial of services should be made available in a time-bound manner. This will provide clarity of regulations and ease of doing business.

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

**Response: NA**