Imagine the Future

unlimit
A Reliance Group Company

**Unlimit's Response to the Consultation Paper on**
**Licensing Framework for Satellite-Based Connectivity for Low Bit Rate Applications**

## Executive Summary

A. **Small device(s) based satellite services provide an important alternative, albeit sometimes even better than the cellular or dual SIM cellular service for connectivity of IoT devices.**

B. **Both the models viz, Hybrid model consisting of LPWAN and Direct to Satellite connectivity, as described in the CP, should be permitted to provide satellite-based connectivity for IoT devices and low-bit-rate applications.**

C. **To provide an enabling regulatory environment that ensures freedom for development of innovative digital services without worrying about the regulatory compliances for the connectivity there should be no restriction on providing satellite connectivity through any particular network topology / any combinations of topologies.**

D. **All types of satellites viz, Geo Stationary, Medium and Low Earth orbit Satellites, without any restrictions on any specific type of satellite orbital constellation too should be permitted to be used for providing satellite-based low-bit-rate connectivity.**

E. **IoT services are evolutionary in nature instead of being available readily 'of the shelf' therefore, it is difficult to predict as to what type of service can be formulated based on what type of satellite connectivity.**

F. **It is imperative that no restrictions are imposed through the regulatory environment that may result in creating a barrier for any new innovative service that can be launched later.**

G. **Accordingly, all the frequency bands in which communication satellites operate such as L-band, S-band, C-band, Ku-band, Ka-band and other higher bands, should be allowed to be used for providing satellite-based IoT connectivity, without any restrictions, as different bands are used for communication systems having different characteristics.**

H. **The existing licensing framework may be suitably amended for the provision of Satellite-based connectivity for modern digital (not only low-bit-rate) applications and services.**

I. **Modern day digital services eco-system demands an enabling regulatory environment that ensures freedom for development of innovative digital services without worrying about the licensing complications for satellite services. Accordingly, the satellite services authorization should be made technology and network topology agnostic.**

J. **All different types of UL authorizations for satellite communications viz, GMPCS and VSAT CUG (Captive & Commercial) should be subsumed in a single satellite services authorization under UL.**

K. **The scope of GMPCS authorization may be enhanced / suitably modified to permit the licensees to provide, technology and network topology agnostic, satellite-based connectivity for IoT devices as well as any other type of communication within the service area.**

L. **The VSAT Service should be permit to use any technology and any kind of ground terminals (without any CUG conditions) to provide the satellite-based (not only low-bit-rate) connectivity for IoT devices as well as any other type of communication within the service area.**

| Recommended charges (Rs in Cr) for Satellite Services (National Area) Authorization under UL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Service Type | Min Equity | Min Networth | Entry Fee | PBG | FBG | Application Processing Fee |
| 1 | Large Entity | 2.5 | 2.5 | 1 | 2.5 | 1 | 0.005 |
| 2 | Start-Up | 1 | 1 | 0.25 | 0.25 | 0.25 | 0.005 |

M. **There is definitely a need to revisit charges, such as NOCC annual fee, for making satellite services competitive to terrestrial cellular services.**

N. **Given the fact that only one INSAT MSS-R service authorization license was issued, which too is non-operative since last 5 to 6 years, it is recommended that this authorization be scrapped from the list of authorizations of UL.**

O. **NLD Licensees are already permitted to carry 'bearer' traffic for 'enterprise / bulk bandwidth' customers and they should be permitted for M2M SPs as well without any distinction between human or machine traffic.**

P. **NLD Licensees should be permitted to carry traffic over Satellite media as well without any distinction between human or machine traffic.**

Q. **In case of Satellite media, the levies as per satellite systems can be imposed in addition to those of the NLD services provided through terrestrial media.**

R. **The licensees should be permitted to obtain satellite bandwidth from foreign satellites in order to provide low-bit-rate applications and IoT connectivity with mandated establishment of the Earth Satellite Gateway in India.**

S. **We are in complete agreement with TRAI's observation that 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.**

T. **We also endorse the areas identified by TRAI, in the CP, and recommend that suitable measures be taken to make the satellite-based services affordable as well as competitive with respect to terrestrial services in India.**

U. **We are in agreement with TRAI that the procedures to acquire a license for providing satellite-based services in the existing framework is not at all convenient for the applicants and the measures suggested by TRAI in its recommendations on 'Ease of doing Business' as well as in the CP should be implemented for the same.**

**Detailed Response**

Our specific comments on the issues posed by the Authority are given in the subsequent paragraphs.

**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.**

**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.**

**Our Response**

**Yes, both the models should be permitted to provide satellite-based connectivity for IoT devices and low-bit-rate applications. In fact, there should be no restriction on providing satellite connectivity through any particular topology / any combinations of topologies.**

**All types of satellites viz, Geo Stationary, Medium and Low Earth orbit Satellites, without any restrictions on any specific type of satellite should be permitted to be used for providing satellite-based low-bit-rate connectivity.**

1. According to the global innovation mapping and research company StartupBlink, which gathers local data of every country to rank their startup ecosystem based on the quality of startups, business environment coupled with the number of startups and support organisations such as accelerators, coworking spaces, startup events along with technology infrastructure, red tape, bureaucracy, etc, India had moved down from 17$^{th}$ position in 2019 to 23$^{rd}$ in 2020 out of 100 countries. As per this report, India continues to face “some immense infrastructure problems” affecting entrepreneurs and urges the government to improve the infrastructure as “other countries in the region are growing fast.”
2. Digital services today, are no more standalone by product of a network or a pair of boxes; they are firstly divorced from the network and secondly, are an amalgamation of multiple services, that are sourced from different sources, service providers and vendors. The construct of a digital service has a telecom device and the corresponding telecom connectivity as the base.
3. Data connectivity is the blood line of any digital service. Modern VSAT technologies and topologies, as described in the CP, form an important connectivity element of the digital services eco-system. Given that the NIAs mandate only 90% coverage of the LSA as the minimum roll-out obligation for establishing a licensed spectrum based cellular network, coverage gaps are bound to be present in commercial networks. At most, the coverage void is decreased to some extent by use of dual SIM connectivity which is prevalent in India.
4. Satellite connectivity, however, has the ability to ensure ubiquitous connectivity for the entire geographical area of the LSA. Towards this end, **small device(s) based satellite services provide an important alternative, albeit sometimes even better than the cellular or dual SIM cellular service for connectivity of IoT devices.**

5. Taking a cue from the StartupBlink report on rankings of nations for eco-system of start-ups, it is important to ensure better infrastructure availability for boosting India's 3rd largest start-up eco-system in the world. It is equally important to provide an enabling regulatory environment that ensures freedom for development of innovative digital services without worrying about the regulatory compliances for the connectivity. Accordingly, there should be no restrictions either on the type of network topology or any type of satellite orbital constellations for providing services in India.

**Our Recommendations**

1. **Both the models viz, Hybrid model consisting of LPWAN and Direct to Satellite connectivity, as described in the CP, should be permitted to provide satellite-based connectivity for IoT devices and low-bit-rate applications.**
2. **To provide an enabling regulatory environment that ensures freedom for development of innovative digital services without worrying about the regulatory compliances for the connectivity there should be no restriction on providing satellite connectivity through any particular network topology / any combinations of topologies.**
3. **All types of satellites viz, Geo Stationary, Medium and Low Earth orbit Satellites, without any restrictions on any specific type of satellite orbital constellation too should be permitted to be used for providing satellite-based low-bit-rate connectivity.**

**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.**

**Our Response**

**All the bands should be allowed to be used for providing satellite-based IoT connectivity, without any restrictions.**

1. **IoT services are evolutionary in nature instead of being available readily 'of the shelf'.**
2. Most of the services are developed through newer innovations post general observations / analysis of the data that gets collected from any other IoT service. Even similar requirements can be met in different innovative ways through different IoT services. Accordingly, **it is difficult to predict as to what type of service can be formulated based on what type of satellite connectivity.** Since these different bands are used for communication systems having different characteristics, **it is imperative that no restrictions are imposed through the regulatory environment that may result in creating a barrier for any new innovative service that can be launched later.**

**Our Recommendation**

**All the frequency bands in which communication satellites operate such as L-band, S-band, C-band, Ku-band, Ka-band and other higher bands, should be allowed to be used for providing satellite-based IoT connectivity, without any restrictions, as different bands are used for communication systems having different characteristics.**

**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.**

**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?**

**Our Response**

**The existing licensing framework may be suitably amended for the provision of Satellite-based connectivity for modern digital (not only low-bit-rate) applications and services.**

**Yes, the scope of GMPCS authorization may be enhanced / suitably modified to permit the licensees to provide, technology and network topology agnostic, satellite-based connectivity for IoT devices as well as any other type of communication within the service area.**

**Yes, the VSAT Service should be permit to use any technology and any kind of ground terminals (without any CUG conditions) to provide the satellite-based (not only low-bit-rate) connectivity for IoT devices as well as any other type of communication within the service area.**

1. Various satellite services authorizations listed in UL were based on the requirement of provisioning voice, messaging and data connectivity for 2G era of human usage applications. Moreover, the satellite network topologies were more suitable for provisioning enterprise class of B2B type of services rather than B2C which have become possible now.
2. Modern day digital services are provisioned over the network and have vastly enhanced network QoS requirements as well as the emphasis has shifted to Quality of Experience (QoE) of the digital service. As brought out in response to questions 1 & 2, digital services today, are no more standalone by product of a network or a pair of boxes; they are an amalgamation of multiple services that have telecom connectivity as the base.
3. As per recent media reports (Figure 1 Refers), Starlink from SpaceX is already provisioning beta testing version of its satellite based high speed (50 and 150 Mbps) internet connectivity in India through a network of about 12,000 satellites. Such high services have the potential of opening up avenues for development of newer innovative digital services. In fact, it has the potential of redefining various standards for existing IoT services such as AIS 140 wherein, at present dual SIM connectivity is mandatory to minimise any terrestrial cellular coverage gaps. Given that ubiquitous & high-speed alternative data services shall be available through the satellite, the AIS 140 standard itself can be made connectivity technology agnostic.

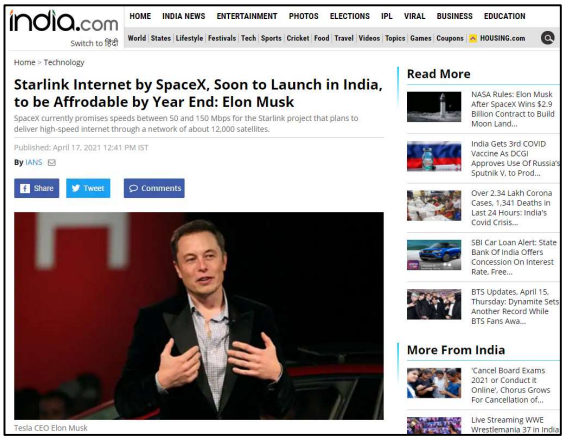


**Figure 1**

4. For the satellite services to be competitive with respect to terrestrial cellular services, even the taxation and charges structures shall have to suitably modified. As brought out in the CP itself, the NOCC charges @ Rs 10,000/-, p.a. per VSAT terminal / Earth station would prove to be onerous as the number of IoT devices would be too large. There is definitely a need to revisit such charges for making satellite services competitive to terrestrial cellular services.

## Our Recommendations

1. **The existing licensing framework may be suitably amended for the provision of Satellite-based connectivity for modern digital (not only low-bit-rate) applications and services.**
2. **Modern day digital services eco-system demands an enabling regulatory environment that ensures freedom for development of innovative digital services without worrying about the licensing complications for satellite services. Accordingly, the satellite services authorization should be made technology and network topology agnostic.**
3. **All different types of UL authorizations for satellite communications viz, GMPCS and VSAT CUG (Captive & Commercial) should be subsumed in a single satellite services authorization under UL.**
4. **The scope of GMPCS authorization may be enhanced / suitably modified to permit the licensees to provide, technology and network topology agnostic, satellite-**

**based connectivity for IoT devices as well as any other type of communication within the service area.**

5. **The VSAT Service should be permit to use any technology and any kind of ground terminals (without any CUG conditions) to provide the satellite-based (not only low-bit-rate) connectivity for IoT devices as well as any other type of communication within the service area.**

| Recommended charges (Rs in Cr) for Satellite Services (National Area) Authorization under UL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Service Type | Min Equity | Min Networth | Entry Fee | PBG | FBG | Application Processing Fee |
| 1 | Large Entity | 2.5 | 2.5 | 1 | 2.5 | 1 | 0.005 |
| 2 | Start-Up | 1 | 1 | 0.25 | 0.25 | 0.25 | 0.005 |

6. **There is definitely a need to revisit charges, such as NOCC annual fee, for making satellite services competitive to terrestrial cellular services.**

**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.**

**Our Response & Recommendation**

**Given the fact that only one INSAT MSS-R service authorization license was issued, which too is non-operative since last 5 to 6 years, it is recommended that this authorization be scrapped from the list of authorizations of UL.**

**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.**

**Our Response**

**Yes, NLD Service providers should be permitted to provide satellite-based connectivity for IoT devices.**

1. It is brought out that in a hybrid network topology for satellite services, where the data from sensors of the M2M service shall aggregate, would need a leased circuit / a VPN type of connectivity for back hauling of the aggregated traffic to the servers that are hosted in a Data Centre.
2. Since NLD Licensees are already permitted to carry 'bearer' traffic for 'enterprise / bulk bandwidth' customers, the same can firstly, be permitted for M2M SPs as well without any distinction between human or machine traffic and secondly, they should be permitted to carry traffic over Satellite media as well.
3. In case of Satellite media, the levies as per satellite systems can be imposed in addition to those of the NLD services provided through terrestrial media.

**Our Recommendations**

1. **NLD Licensees are already permitted to carry 'bearer' traffic for 'enterprise / bulk bandwidth' customers and they should be permitted for M2M SPs as well without any distinction between human or machine traffic.**

2. **NLD Licensees should be permitted to carry traffic over Satellite media as well without any distinction between human or machine traffic.**
3. **In case of Satellite media, the levies as per satellite systems can be imposed in addition to those of the NLD services provided through terrestrial media.**

**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.**

**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.**

**Our Response & Recommendation**

**Yes, the licensees should be permitted to obtain satellite bandwidth from foreign satellites in order to provide low-bit-rate applications and IoT connectivity with mandated establishment of the Earth Satellite Gateway 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.**

**Our Response & Recommendation**

**Yes, we are in complete agreement with TRAI's observation that 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.**

**We also endorse the areas identified by TRAI, in the CP, and recommend that suitable measures be taken to make the satellite-based services affordable as well as competitive with respect to terrestrial services in India.**

**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.**

**Our Response & Recommendation**

**We are in agreement with TRAI that the procedures to acquire a license for providing satellite-based services in the existing framework is not at all convenient for the applicants and the measures suggested by TRAI in its recommendations on 'Ease of doing Business' as well as in the CP should be implemented for the same.**

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