

Issues for Consultation
TRAI CP on
'Licensing framework for Satellite based
connectivity for low bit-rate applications.'

Background:

Satellites can be used in the areas of agriculture and soil, renewable energy, environment, land, water, rural and urban development, power and electricity, transportation, industrial automation, oil and natural gas, military, health, education, etc. Commercial VSAT CUG service authorization permits the provision of data connectivity using VSAT terminals to CUG users. It will allow more private participation and allow the provision of any satellite-based connectivity within any service area.

L-band, S-band, C-band, Ku-band, Ka-band and other higher bands should be used to provide satellite-based IoT connectivity.

Satellite-based low-bit-rate connectivity is possible using GEO, MEO and LEO. All satellites should be permitted to be used for providing satellite-based low-bit-rate connectivity. A hybrid model consisting of LPWAN and satellite, and (ii) Direct to satellite connectivity models should be permitted to provide satellite connectivity for IoT devices and low-bit-rate applications.

SIA-India response to TRAI questionnaire:

Q1. There are two models of Satellite-based connectivity for IoT and low-bit-rate applications (i) a Hybrid model consisting of LP WAN and Satellite 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.***
- (ii) Is there any other suitable model through which satellite-based connectivity can be provided for IoT devices? Please explain in detail with justification.***

SIA-India response:

i). SIA-India believes that both models (i.e. Hybrid and Direct to Satellite) should be permitted. There are use cases requiring a Hybrid model where several IoT devices, usually of low power, are connected to a satellite terminal that serves for aggregating the data from these devices and connecting it to the relevant application server through satellite backhauling. Examples of such use cases include agriculture and mining, earthquake sensor monitoring, tsunami water level

monitoring etc. Other use cases may need single IoT devices connectable directly to the satellite for asset tracking/management, open and closing valves on pipelines etc. In both cases, the licensing framework should be minimal and flexible enough to encourage the uptake of these critical services.

Accordingly, the regulatory framework should accommodate both hybrid and direct models, and allow satellite IoT service providers and end users to determine which service model (or combination of service models) is suitable for their requirements. For some IoT applications, it may be efficient to aggregate IoT data for backhaul. For other IoT applications, direct-to-satellite connectivity may make more sense.

With the advent of high throughput satellite systems – in GEO, MEO and LEO – TRAI should anticipate and recognize that IoT applications will not consist of just “low bit rate” applications, and that markets for broadband IoT exist and are growing.

ii). The regulatory framework should accommodate any type of satellite IoT connectivity that service providers and users may find suitable for their needs. However, we would caution against creating more and more service types under a unified licensing regime for specific kinds of satellite applications and to instead expand existing satellite service categories to accommodate the additional service. Having too many sub-categories of services, especially if subject to different conditions, will defeat the purpose of having a convenient unified licensing instrument and may artificially restrict the ability of service providers to tailor solutions to meet market requirements. Instead, the regulatory framework should be flexible enough to enable satellite service providers and end users to innovate, discover and create new satellite-based IoT and other applications that can be efficiently delivered through low- or high-capacity satellite links, as appropriate.

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.

SIA-India response:

IoT/M2M services are, in most cases, low data rate applications that do not generally require very low latency. Accordingly, GEO satellites are well suited, but so are also LEOs and MEOs. As TRAI has found, and as shown by the examples in Q1 above, satellite-based IoT connectivity is already being delivered today using GEO, MEO and LEO satellites. Many IoT applications today, such as sensor and tracking networks, are latency insensitive. Therefore, there is no reason to think that such applications should be limited to any one kind of satellite orbit. Each kind of orbit has its own advantages and disadvantages for different types of applications, and it is good public policy to provide end users with a choice of suitable, competitive options for satellite IoT. In addition, as indicated above, with the advent of high throughput satellite systems in GEO, MEO and LEO, satellite-based IoT applications that require higher bit rates and lower latency can also be supported, and the regulatory framework will need to accommodate broadband IoT applications as well.

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 used to provide satellite-based IoT connectivity? Please justify your answer.

SIA-India response:

Industry experience with IoT/M2M applications and services worldwide shows that the L-band is convenient for this type of services. It presents high reliability, mobility, global coverage, devices availability and can accommodate low data rates. However, depending on the availability of satellite systems, other frequency bands can also be used. The service needs to be frequency agnostic and all frequency bands should be considered for 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.

SIA-India response:

Existing licensing framework for satellite services includes regulatory requirements that cover both data and voice services via satellite. IoT/M2M is a particular type of data services using low data throughputs and doesn't differ from the satellite backhauling perspective compared to other data services. The existing licensing framework should be suitable to cover these services from a connectivity perspective. However, it is necessary to relax certain requirements related to the terminals licensing to make business cases viable for IoT/M2M and encourage the uptake of these services. For instance, IoT/M2M terminals are expected to be very large in number in many use cases, and imposing licensing fees per terminal would be a huge burden to IoT/M2M providers. At SIA-India, we are of the view that using the existing licensing framework that enables satellite services and relaxing per terminal licensing fees in the particular case of IoT/M2M would be a suitable approach to make these services available to end-users in a manner that will guarantee their success and rapid uptake. More in general, individual terminal-by-terminal fees should be avoided when dealing with number of ubiquitous user terminals with similar technical and operational characteristics (in other words, a "blanket license" approach would be more suitable).

SIA- India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications, including lower fees and fee structures that would support large scale deployments under a variety of business models. Satellite-based connectivity has proven to be a cost-competitive and efficient alternative to the provision of broadband – whether directly or by extending terrestrial networks – especially in places that would otherwise be difficult or impossible to reach with terrestrial infrastructure. From a regulatory and spectrum management perspective, the work involved is essentially the same for low-bit-rate vs. broadband applications, and it is simply a matter ensuring that the licensing and fees framework is not itself a barrier to the widespread deployment of satellite-based connectivity, whether for low-bit-rate IoT or broadband "digital divide" applications. As indicated above, having too many types of services within the

Unified Licensing system, with varying requirements, can defeat the purpose of having a convenient unified licence and artificially restrict the ability of service providers to tailor solutions to meet market requirements.

Q5. *The existing authorization of GMPCS service under Unified License permits the licensee to provide 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.*

SIA-India response:

As stated above, the existing licensing framework for satellite services includes regulatory requirements covering both data and voice services via satellite. This includes current authorizations and licenses for GMPCS/GSPS, which have very stringent requirements, including establishing a satellite gateway in India. IoT/M2M should be permitted under these existing licenses/authorizations for GMPCS/GSPS with appropriate relaxation of the terminals licensing scheme.

SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications. [pls see response to Q4 above] In allowing different types of services under the Unified Licence to address satellite-based IoT markets, the DoT will want to ensure that differing license requirements for the different types of services are justified and do not distort competition.

Q6. *Commercial VSATCUG 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.***

SIA-India response:

SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications. See response to Q4 above. In allowing different types of services under the Unified Licence to address satellite-based IoT markets, the DoT will want to ensure that differing license requirements for the different types of services are justified and do not distort 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?

(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?

SIA-India response:

SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications. See response to Q4 above. In allowing different types of services under the Unified Licence to address satellite-based IoT market, the DoT will want to ensure that differing license requirements for the different types of services are justified and do not distort competition.

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

SIA-India response:

SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications.

[See response to Q4 above]

In allowing different types of services under the Unified Licence to address satellite-based IoT market, the DoT will want to ensure that differing license requirements for the different types of services are justified and do not distort competition.

Q9. (i) As per the scope mentioned in the Unified Licence 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.

SIA-India response:

SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications. See response to Q4 above. In allowing different types of services under the Unified Licence to address satellite-based IoT market, the DoT will want to ensure that differing license requirements for the different types of services are justified and do not distort competition.

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.

SIA-India response:

Providers of low bit-rate applications and IoT connectivity, and any other satellite-enabled services, should have non-discriminatory access to both domestic and foreign satellite capacity. This is the most appropriate way to simplify access to satellite services and encourage investment in the sector by lowering the cost burdens associated with the licensing requirements. This, in turn, stimulates technological developments and increases competition in the market. The result would be better access to satellite services at lower cost and higher quality, with innovative use cases.

Licensees should be permitted to obtain satellite bandwidth from foreign satellites for both low-bit-rate and broadband satellite applications. Satellite bandwidth can vary by coverage, resistance to rain, and throughput, and Indian satellite end users should be able to choose the available satellite bandwidth that is most appropriate for their needs. In the case of satellite-based IoT applications – whether it be a sensor network, asset tracking network, or connectivity to a remote mine site – having the right combination of coverage and throughput may be quite important. Indian end users should have the option of procuring its requirements directly from the satellite bandwidth provider.

The national goal of AtmaNibhar Bharat envisages a vibrant and self-reliant manufacturing and service industry in India, Towards this goal, the foreign satellite systems should be encouraged over next 3 year period to have at least 20% (TBD) of their satellite manufacture process or value to be done in India. The Indian manufacturers are to be provided incentives to facilitate such activities and for cost competitiveness.

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.

SIA-India response:

There should be no specific condition linked to the satellite being foreign. Current Indian rules require Indian VSAT traffic to land at a hub in Indian territory as a security measure. While not unreasonable in the case of a domestic VSAT network, such a measure can introduce difficulties or inefficiencies in the case of satellite networks that spans international boundaries (e.g. aero or maritime mobility networks) or in which the proportion of satellite terminals operating in India is small relative to the overall size of the network. India may want to consider different or more flexible rules that will allow India to maintain its security interests while taking advantage of efficiencies that may come from not requiring a hub in Indian territory. For example, it should be possible to satisfy lawful intercept requirements without an in-country hub by requiring traffic to be mirrored or made available in-country in response to a lawful order.

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.

SIA-India response:

There are two main sets of actions that will have a direct impact on the cost of satellite-based services in general:

Increasing competition: the key enabler to increase competition amongst players in the satellite market is to allow **non-discriminatory access to domestic and foreign satellite capacity in a level playing field.**

Lowering licensing costs: this can take the form of reducing the current complexity of the licensing journey and simplifying the overall licensing process, as well as reducing the direct licensing costs.

Satellite-based services remain cost-competitive vis a vis terrestrial technology, e.g., for the provision of DTH, direct broadband connectivity and cellular backhaul. If satellites were not cost-competitive, terrestrial options would no doubt be deployed everywhere. However, satellite is widely deployed in India and remains a key technology for expanding connectivity India in a cost-effective way.

That being said, demand for satellite connectivity in India has outstripped the supply that has been made available due to regulatory and structural barriers in the Indian satellite communications sector. Even though many international satellite operators have invested in new satellite capacity over India, the Department of Space/ISRO determines whether and when such capacity will be made available for use in India, which has resulted in a significant amount of satellite capacity over India sitting idle for extended periods of time. The easing of such barriers to entry would make more satellite capacity immediately available for meet India's National Digital Communications Policy 2022 goals, and put downward pressure on prices.

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.

SIA-India response:

The current procedures to acquire licenses/authorizations for satellite-based services are very complex. A many licensing stakeholder with whom an applicant has to communicate separately. This makes the licensing journey very lengthy, costly, and in some instances, confusing. A single window clearance or at least reducing the number of entities involved in the overall licensing procedure, together with ensuring a non-discriminatory entity involved in the licensing process and streamlining access to domestic and foreign satellite capacity in a level playing field, will be very beneficial to the satellite industry in India.

As indicated above, SIA-India supports streamlining of the licensing framework for all satellite-based connectivity applications, not just low-bit-rate applications. Specifically, TRAI's proposal for "single window clearance" for all kinds of satellite-based processes

would be a most-welcome improvement for the ease of doing business in India for the satellite industry. While SIA-India recognizes that multiple components of the Government of India may have a legitimate stake in satellite-related matters, there is no reason that proper review cannot be simplified and systematized in a way that reduces processing times and burdens on those seeking to provide satellite-based connectivity in India.

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

SIA-India response:

The IoT/M2M is one the new areas that is likely to encompass all sectors of activities for improved utilization of resources, productivity, etc. . The number of IoT devices (sensors and communications module) will be very large and in millions. Towards this and consistent with the goal of Atmanirbhar Bharat, manufacturing of these devices in India should be encouraged and provided incentives.

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