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Consultation Paper on Licensing Framework for Satellite-based connectivity for low bit rate applications – Consultation Paper No. 1/2021

Dear Sir,

SES S.A. (“SES”) is pleased to submit its comments on the Telecom Regulatory Authority of India Department of Telecommunications (“TRAI”) *Consultation Paper on Licensing Framework for Satellite-based connectivity for low bit rate applications*, released on 12 March 2021 (“Consultation”). SES is a global satellite operator that operates a fleet of 50 satellites in geostationary orbit (“GEO”), as well as the innovative O3b Ka-band constellation of High Throughput Satellites (“HTS”) in medium Earth orbit (“MEO”). With its multi-orbit fleet of satellites, SES provides satellite capacity that supports a wide range video and data applications, including both low- and high-bit-rate IoT applications.

SES provides its comments to TRAI’s specific questions below. At the outset, however, SES notes that the User Data Speed listed for O3b in Table 3 of the Consultation is incorrect. SES’s O3b constellation can support throughputs of up to **1.2 Gbps** per user terminal today (not 2.1 Mbps). Our next-generation O3b mPOWER constellation (launching in 2021) will be able to flexibly support even higher throughputs.

RESPONSES TO ISSUES FOR CONSULTATION

- 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 connectivity for IoT devices and low-bit-rate applications? Please justify your answer.***
 - (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.***

SES Response:

- (i) Both models of satellite-based connectivity for IoT applications should be permitted. IoT and IoT-like applications have been provided via satellite under both models around the world for many years on LEO, MEO and GEO constellations in a variety of FSS and MSS frequency bands. For example, SES hosts a wide-area, direct-to-satellite IoT weather sensor network on one of its GEO satellites today. Another example is the large quantity of IoT sensor data on marine vessels that are backhauled using SES's O3b MEO constellation.¹ As TRAI is aware, companies like ORBCOMM and Iridium, also offer satellite based IoT applications on their LEO constellations.

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 would be more appropriate.

With the advent of high throughput satellite systems – in GEO, MEO and LEO – TRAI should also anticipate and recognize that IoT applications will not consist of only “low bit rate” applications, and that markets for broadband IoT exist and are growing. Accordingly, the regulatory framework should accommodate both and not be limited to low-bit-rate IoT applications.

- (ii) The regulatory framework should accommodate any type of satellite IoT connectivity service providers and users 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 consider expanding existing satellite service categories to accommodate additional applications. Having too many sub-categories of services, especially if subject to different conditions, will defeat the purpose of a convenient unified licensing instrument and may artificially restrict the ability for service providers to tailor solutions to meet market requirements. 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.*

SES Response: As TRAI has found, and as shown by the examples in response to Q1 above, satellite based IoT connectivity is already being delivered today using GEO, MEO and LEO satellites. Many

¹ We note that, contrary to Table 3 in the Consultation, the O3b MEO constellation today is already capable of providing up to 1.2 Gbps to a single user terminal, and, even more throughput will be possible on the next generation mPOWER constellation.

IoT applications today, such as sensor and tracking networks, are latency insensitive. Thus, such applications are not 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 HTS 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 allowed to be used for providing satellite based IoT connectivity? Please justify your answer.*

SES Response: The use of all satellite frequency bands should be allowed to provide satellite based IoT connectivity. Satellite-based IoT connectivity is already being provided in the L-band, S-band, C-band, Ku-band and Ka-band frequencies, with both dedicated constellations (e.g. ORBCOMM) and multi-purpose communications satellites capable of performing this function. For example, the weather sensor network mentioned above is on one of SES's C-band satellites, which takes advantage of the wide area coverage and rain-fade resistance of the C-band frequencies. Similarly, SES's O3b constellation provides high-capacity IoT backhaul (along with high-speed Internet) to maritime vessels by using the Ka-band frequencies. As IoT networks become more demanding in terms of throughput, the wider bandwidths available at higher frequency bands will become more important and necessary to support related services.

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.

SES Response: SES 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 for 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 administrative work involved to process an application 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 multiple categories 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 for service providers to tailor solutions to meet market requirements.

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.*

SES Response: SES 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.

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.*

SES Response: SES 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-bitrate 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-bitrate IoT connectivity for captive use?*

(iii) *If yes, what should be the charging mechanism for spectrum and license fee, in view of requirement of many ground terminals to connect large number of captive IoT devices?*

SES Response: SES 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 INSAT MSS-R service authorization should be modified to provide the satellite-based connectivity for IoT devices? Please justify your answer.*

SES Response: SES 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 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.

SES Response: SES 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.

SES Response: 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. Satellite end users in India, 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 their requirements directly from the satellite bandwidth provider.

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.

GSC Response: 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 span 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 maintain its security interests while taking advantage of technological developments that would effectively address concerns on monitoring of data traffic or unauthorized use of earth stations, without the need for local installations.

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.



SES Response: 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 elsewhere) and remains a key technology for expanding connectivity throughout 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 to 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.*

SES Response: As indicated above, SES 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 SES recognizes that multiple components of the Government of India may have a legitimate stake in the administration and oversight of satellite-related matters, there is no reason that proper review cannot be simplified and systematized to reduce 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.*

SES Response: None at this time.

Please contact me or my colleague, Tare Brisibe (tare.brisibe@ses.com), if you have any questions.

Yours Sincerely,

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