



NELCO/TRAI/212204  
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To  
The Advisor (NSL)  
TRAI, MTNL, JLN Marg  
New Delhi - 02

**Kind Attn: Shri ST Abbas**

Sub: Comments on the Licensing Framework for Establishing Satellite Earth Station Gateway

Dear Sir,

Please find enclosed our suggestion /comments on Consultation paper on Licensing framework for establishing satellite earth station gateway.

We M/s Nelco Ltd. , A Tata Enterprise, is a Satellite Communication Service Provider in India, providing highly reliable connectivity solutions across the country. Nelco Ltd. currently holds licenses for Commercial VSAT Closed User Group (CUG) Communication Services and have the IFMC authorization from DOT.

For any clarification we are available for discussion.

Thanking you

For **Nelco Ltd.**

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A **TATA** Enterprise

## Nelco Response wrt

### Consultation Paper on Licensing Framework for Establishing Satellite Earth Station Gateway

We would like to thank TRAI for coming up with much need consultation paper related to satellite earth station gateway. Satellite communication industry is at the cusp of transformation – thanks to new technologies and NGSO satellite constellations that are in process of getting established. As pointed out in the consultation paper, till now Geostationary – wide beam satellites are mostly used and as such satellite, one beam covers complete India – there was no need to have separate earth station license.

As HTS/MEO/LEO satellites are getting launched wherein architecture of these are different, it is imperative to have policies which provides required clarification and direction wrt licensing framework around such new generation satellite systems. We hereby accordingly submit are response wrt queries raised in this consultation paper wrt HTS/MEO/LEO satellite systems.

#### **Q1. Whether there is a need to have a specific license for establishing satellite Earth Station Gateway in India for the purpose of providing satellite-based resources to service licensees? Do justify your answer.**

As of now, satellite communication service providers (SCSP) are primarily providing services using Geostationary satellites - most on traditional wide-beam satellites. In GSO wide beam satellites - one beam typically covers wider area to the extent of covering complete India mainland and thus for service licensee it is easy to install its own satellite earth station. That is how the business has been successfully operational from the very beginning.

The Service licensee (SCSP) operating on GSO-widebeam satellites have invested heavily considering existing licensing framework and also created their long-term business models around the same. It is important to protect the investment made by Service licensee on GSO-widebeam satellites. Thus, for **GSO-wide beam satellites, the earth stations are established by Service Licenses and thus there is no need to have separate license for establishing satellite Earth Station Gateway in India.**

For **GSO-HTS** satellites, there are two types of HTS satellites –

- i) **HTS Type – I (Single Gateway per Satellite):** In these HTS, though there are multiple user beams but there is only one Gateway which caters all the beams over India and sometimes beyond India as well. In such a scenario, the gateway investment is required only in one location, which is similar to that of GSO-widebeam satellites. Currently the VSAT Service licensee installs such gateways. In such scenarios, there is no need to have separate license for satellite earth station gateway in India.
- ii) **HTS Type – II (Multiple Gateway per Satellite):** In this type of HTS technologies there are multiple user beams and there are multiple Gateways required – either one Gateway per beam or one Gateway for set of beams, to cover the overall footprint over India. In such cases, to make it more efficient and make it easier for the usage of bandwidth on various

beams, there should be a separate license for establishing Satellite Earth Station Gateway in India.

The technology of **NGSO constellations** is complex and global in nature due to a large number of satellites forming each constellation. This will involve getting data from multiple moving satellites and hence will need to have multiple steerable antennas which will work in close co-ordination with different satellites in the constellation. The operations of such gateways are thus more complex and capex intensive. Moreover, there may be need for more than one gateways in the country for each LEO constellation. To make it more cost efficient, better manageability and ease of adoption by the users, it is recommended to have separate license for Earth Stations Gateway in India for NGSO.

**Q2. If yes, what kind of license/permission should be envisaged for establishing Satellite Earth Station Gateway in India? Do provide details with respect to the scope of the license and technical, operational, and financial obligations, including license fee, entry fee, bank guarantees, and NOCC charges, etc.**

Wrt GSO-HTS (type- II mentioned above), the scope of the license should cover establishing Gateway infrastructure, Operations & management of the infrastructure.

Earth station licensee should be required to setup the teleport and offer it to Service licensee. The resource sizing like number of antennas required etc should be done by Earth Station licensee as per regulatory guidelines. Earth Station licensee would also do the operations & maintenance of the infrastructure so as to provide SLA based services to Service licensee. The Services should be supported by required helpdesk and trouble-ticketing system.

The Service Licensee is paying license fee as percentage of overall AGR. In addition, Spectrum usage charges are also paid by Service licensee as percentage of overall AGR. As these charges are already paid by Service licensee, there is no need for charging for additional license fee or SUC charges, though there can be some nominal fixed one-time charges basis size of antennas used by Earth Station Licensee at the Earth Station Gateway. It is recommended to do away with NOCC charges for GSO-HTS (type-II) and NGSO system.

Earth Station licensee is going to make large investment wrt gateway infrastructure including Land, RF, antenna farm etc at Gateway location. It is expected that only serious Indian entities – Satellite operator/subsidiary of satellite operator/Indian entities having tie-up with satellite operator, will be applying for the Earth Station license. Considering this, the entry fees should be kept at the minimal.

**Q3. Whether such Earth Station license should be made available to the satellite operator or its subsidiary or any entity having a tieup with the satellite operator? Do justify your answer.**

Depending upon need and/or business relationships, Earth Station may be established by an Indian entity which is the satellite operator or by its subsidiary or by Indian entity having tie-up with satellite operator.

Satellite operator may have direct presence in India or may have its subsidiary in India and accordingly may like to establish and take Earth Station Gateway license. In other scenario, a satellite operator may have business relationship & tie-up with another Indian Entity, which may take the Earth Station License and establish the gateway.



As it is dependent on business needs, the flexibility should be provided from regulatory perspective and should be best decided by market.

**Q4. What mechanism/framework should be put in place to regulate the access to satellite transponder capacity and satellite based resources of a Satellite operator/Earth Station licensee by the service licensees so as to get the resources in a time-bound, transparent, fair and non-discriminatory manner?**

Earth Station licensee should be considered as an enabler to access the satellite capacity of the respective satellites.

As Earth station licensee will be either satellite operator or Indian entity having tie-up with satellite operator, and Earth station licensee is like shared infrastructure provider. It is suggested that Service licensee should be mandated to buy the capacity from satellite operator.

While the system should be in place to ensure that the service licensee seeking bandwidth from Earth Station Licensee are responded in time-bound manner, the commercial agreement between service licensee and Earth Station Licensee should be decided between these two parties as per business relationship & market needs.

**Q5. Whether the Earth Station Licensee should be permitted to install baseband equipment also for providing satellite bandwidth to the service licensees as per need? Provide a detailed response.**

Service licensees are managing the customer & customer related configurations at the network so as to ensure that services are configured & provided as per contract. Any related troubleshooting, change management is also done by Service licensee. This way Service licensee has control, visibility & management over quality of services. This domain is core part of the Services provided by Service provider and thus should remain with Service licensee.

**GSO-HTS:** Technically, GSO-HTS is providing transparent connectivity and is less complex and is independent of baseband equipment. The scope of Earth Station licensee should be limited to putting up Antenna, RF equipment only. It may also be noted that different Service Licensees have different baseband preferences. Invariably the Service Licensee deploys more than one baseband technologies to address different applications/market segments. Baseband equipment should be installed by Service licensee only to have full control over the services provided to its customers.

**NGSO:** NGSO satellite operator will need to play a much bigger role to ensure that there is proper satellite communication taking place. To make this happen, the NGSO Satellite operator needs to ensure that all the components are tightly coupled and working in tandem. As such it may be important for the NGSO satellite operator to install the baseband also in the Earth Station Gateway, apart from the RF & the antenna systems. In case the baseband equipment is installed by Earth Station licensee then it should be mandated to partition the Network Management System and provide such partitioned NMS to respective Service licensee so that respective Service licensee gets full control, configuration & management of the services provided to its customer.



In case wherein service licensee wants to put dedicated baseband and as per its business understanding with Earth Station Gateway licensee and satellite operator, it should be also allowed to put baseband equipment.

**Q6. What amendments will be required to be made in the existing terms and conditions of the relevant service authorizations of Unified License, DTH License/Teleport permission to enable the service licensee to connect to the Satellite Earth Station Gateway established by Earth Station Licensee/Service Licensee, for obtaining and using the satellite transponder bandwidth and satellite-based resources? Do justify your answer.**

DOT has recently modified the unified license and revised sub-clause 33.3 states as “An authorized Gateway hub operated by the Satellite Provider itself is permitted to be shared with the bandwidth seeker”.

As per above, it allows for sharing of Gateway hub but in view of proposed Earth Station license the clause need to be modified as to provide clarity wrt its applicability for GSO-HTS and NGSO system. It is suggested that the clause should be modified as

“An authorized Earth Station Gateway/Hub operated either by the Satellite Operator or its designated Indian entity is permitted to provide its shared gateway services to authorised service licensee”

**Q7. Whether the sharing of Earth Station among the licensees (between proposed Earth Station licensee and Service Licensee; and among service licensees) should be permitted? Do provide the details with justification.**

Sharing of Earth Station resources between Service licensees should be allowed to bring in required cost & operational efficiency. For example, in case of GSO-HTS type-II, there are multiple beams focussed on a particular region/state and as Earth Station licensee would be putting investment to install and operate Earth station gateway, sharing of gateway will help to bring in cost and operational efficiency.

For NGSO, the Gateway will require large resources (land, antenna, RF etc) and to make it commercially viable for Earth station licensee/Service licensee, sharing of Earth Station resources among Service licensee should be allowed.

Sharing among Earth station licensee should be also allowed through technically being different systems working on different constellations, the use-cases and benefits of such sharing may still need to be worked out. Regulatory perspective there should not be restrictions wrt infrastructure sharing between Earth station licensees, and it should be left to be dealt basis business level understanding between Earth Station licensees.

**Q8. To whom should the frequency carriers be assigned: the Earth Station Licensee, or the Service Licensee, or whoever establishes the Satellite Earth Station? Do justify your answer.**

The Satellite Earth Station License shall allow the Earth Station licensee to setup the Teleport Infrastructure to use the satellite spectrum. The Service Licensee would use the satellite spectrum and build the commercial plans & services layer to provide service to its customers.

In case of **GSO-HTS**, the frequency carriers should be assigned to the Service Licensee which is the current practice in India. The Service Licensee is responsible for the design of their network, the frequency / carrier plan using the assigned transponder bandwidth. The carrier plan is one of the key features of the of the Service Licensee, which helps them to run an optimized service and have full control over the network.

For NGSO, Gateway earth stations of different NGSO service operator system may use the same spectrum without any interference. The authorization provided by DoS/INSPACe will take into account the spectrum allocation as per the National Frequency Allocation Plan. Further NOCC approves a detailed carrier plan. So technically, the assignment of spectrum has already taken place for a given satellite, when it is authorized.

If still required the frequency plan to be allocated wrt Gateway, then the spectrum used by the earth station gateway should be assigned to the earth station gateway operator.

For user terminals with NGSO service operations, the satellite spectrum is dynamically shared between multiple users and thus quite difficult to manage the spectrum in pre-defined assignment slots and even if it is done, it may result in inefficient use of the spectrum. Thus, it is suggested that either the user end terminal spectrum should be assigned to all associated Service licensee of that Earth Station gateway or alternatively it may be assigned to Earth Station licensee.

**Q9. What should be the methodology for the assignment of spectrum for establishing satellite Earth Station? Provide a detailed justification.**

The orbit-spectrum resources for satellite communications will continue to be globally co-ordinated and assigned at the ITU level. The satellite will use the globally co-ordinated spectrum/frequencies. The NFAP on the other hand shall specify the frequency bands to be used for specific services. A satellite at any point in time will have only that frequency/spectrum for usage that it has got assigned after global co-ordination and assignment. This spectrum is then assigned to the Service Licensee for delivery satellite based services.

Globally the satellite spectrum is largely administratively allocated. In satellite communication as the spectrum can be shared amongst licensees, it makes it efficient usage of spectrum. Spectrum allocation by auction will lead to segmentation of the spectrum and will drive down the efficiency drastically to lower levels. This will not only increase the cost of spectrum exponentially but also make usage much less efficient leading to unviable from market perspective.

Hence, the methodology for assignment of the spectrum to the Earth Station/Service Licensee should be administratively allocated.

**Q10. What should be the charging mechanism for the spectrum assigned to the satellite Earth Station licensee? Elaborate your answer with justification.**

As Satellite Earth Station licensees are going to be infrastructure provider and will not contract with end customers, Service licensee will continue to provide services to its customer and thus will pay the applicable regulatory charges.

Service Licensee is anyway paying license fee as percentage of overall AGR. In addition, Spectrum usage charges is also paid by Service licensee as percentage of overall AGR. Charging spectrum fee from Earth Station licensee may result in duplication of such fee. As these charges are already paid by service licensee, there is no need for charging for additional license fee or SUC charges.

**Q11. Give your comments on any related matter that is not covered in this Consultation Paper.**

Satellite communication has a significant role to play in achieving the digital India goal of the Government of India. The department should recommend allowing adoption of the latest satellite technologies and availing the technological advancements to unearth the full potential of the satellite communications thereby promoting the Satellite communication activities in India.

We therefore recommend removing some of the barriers which has restricted the growth of the Satellite Communication industry in India so far. To achieve this, we request the following to be considered in your recommendation to the DoT –

- The Ku antenna size restriction of minimum 1M for Fixed sites and 0.60 M for Maritime should be done away with. With the advancement in technologies, there are solutions that work for much smaller antenna size. Smaller form factor VSAT terminals including flat panel antennas (size between 10 – 20 cms) should be allowed for use under the existing & prevailing Service Provider licenses as per their usage.
- The Ka band (27.5-30.0 GHz uplink) is used for the gateway earth station to satellite link in current satellites design and hence access to the full bandwidth at each gateway is important for be able to utilise full potential of satellite capacity. We recommend that 27.5Ghz to 28.5Ghz band should continue to be available for satellite services.
- Process of Spectrum assignment is long and needs to be relooked at. Once an assignment of the entire spectrum used by the satellite (on a shared basis) has happened, the Earth Station operator/service provider should not be required to reapply for specific assignment of spectrum for every increase in the usage of capacity.
- The SACFA process wrt VSATs need to be simplified. Wireless operating license has been exempted for mobile towers, similar exemption should be extended to VSAT terminals.