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**Sent:** Monday, January 3, 2022 5:40:36 PM

**Subject:** TRAI P-6 2021 - Response/Counter comments on establishing ground segments for various satellite systems

Shri S.T. Abbas  
Telecom Regulatory Authority of India  
New Delhi

Sir,

Please find attached our response / counter comments on CP-6 / 2021 (both as Word file and PDF format) on establishing ground segments for various satellite systems.

A hard copy of our response is being sent to you separately.

Best regards,

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## Introduction

There is indeed a need to have a formal system for establishing Gateways in the country, no matter satellite or terrestrial like cable landing stations. The need is compelled for the following reasons

- (a) Toll by-pass means loss of revenue,
- (b) Traceability of the caller and called, and
- (c) A license for setting up any wireless services.

Most importantly, in addition to the above is the capability for legal intercept mechanism of the communications.

There are analogies for example the cable landing stations as alluded to above. This situation is also analogous to flying rights granted to airlines, both for landing and flying over sovereign territory. In situations like hostilities flying of planes from enemy countries are denied flying rights. In all cases some intelligence is on board, human and cargo of sorts on –planes and volumes of Data on various systems of communications transportation. Communications can easily be termed as fourth dimension of transportation. Therefore, any remaining doubts that a regulatory regime of pragmatic licensing of the ground segment of satellite systems is amply justified. Such a consultation is timely as well as desirable.

Having set the scene of the rationale, need etc, we would wish to point out that in addition to the orbits mentioned above there are systems in elliptical orbit, intermediate circular orbit, LEOs, MEOs with inter-satellite links and without inter-satellite links. It must be understood clearly that complimentary ground station would vastly differ in the various cases. The easy bit first in systems with inter-satellite links, possibly, conceivably one can cover the entire communication with just one ground station to route the traffic to respective destinations worldwide. Of course, each country can have their own component of ground stations for reasons mentioned above. The reason being that switching happens in the orbit for routing and not on the ground. However, in systems with no inter-satellite links the ground segment gets complicated, should one require a 24X7 service, because of the limited coverage of the satellite overhead, and dependent upon the orbit, frequency, number of planes of the orbits so on and so forth. Such a system would demand ground segment at multiple locations, with multiple antennae to provide 24x7 service. Which

consequently might require interlinking of a terrestrial inter ground station capability for routing the data to respective destinations.

Thought must be given for direct to consumer application by the use of portable terminal. How are they going to be regulated? Conceivably, there are two main services B2B and B2C

Notwithstanding the above, the ground segment of each system will have to be viewed holistically for various satellite systems, sized accordingly to create a satellite agnostic, holistic regulatory and policy regime. I am taking the liberty of attaching a paper on the subject. IN the past these ground segments was a preserve of the Government or its agencies. The three odd satellite systems which were existing then like Intelsat, Inmarsat, ICO, and Irridium all had their ground segment under the control of the erstwhile VSNL. With this background our responses are below.

### **ISSUES FOR CONSULTATION**

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

As referred to above there is a need to have a regulatory and policy frame work for establishing satellite Earth Station Gateways in India for the purpose of providing satellite-based resources to service licensees. It would be more appropriate to rename this activity as Ground segment of a particular satellite system, with capability to take care of three concerns in the introduction. The ground segment could be shareable as is the case of cable landing stations. The key responsibilities could be of either the owner of the ground segment or of the service provider utilising these facilities. There should be an a priori declaration whether it would provide 24x7 service or restricted service depending upon the visibility of the satellite in LEOs, MEOs, Elliptical Orbit and specific beams in case of GEOs. This activity for communications other than broadcast of entertainment was the responsibility of the government or government owned agencies in the pre liberalisation era. It continues to this day in the case on INMARSAT services, which are provided by BSNL as part of the GMPCS system of INMARSAT.

- 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.

Our response is an emphatic yes for a license and various permissions. In our opinion it could be treated as a package for the satellite provider to be the owner of the ground segment, because they are best suited to know various interfaces and handshakes. Therefore, the ground segment could be targeted as an IP1 license to be used by licensed service providers under the Indian telegraph act 1885 as amended from time to time. Logical, then TSPs, in their own interest, should own up their sovereign responsibility. The satellite service provider could be taxed as per the landing rights charter for a percentage of the earnings a la ILD at 8% of Adjusted Gross Revenue (AGR), spectrum charge, USOF and other levies like GST etc. There could be an entry fee serious enough to be reasonable and not frivolous appearing to be a giveaway, say Rupee 10 million. The earnings of the ground stations would be purely on revenues earned by leasing capacities to TSPs. Provisions should be made so that they are not taxed twice.

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

The infrastructure provision is facilitation for connectivity different from service provision. The satellite system clubbed with ground segment is infrastructure. To reach out to consumers is service. Service requires a license. For service provision, a service license is needed for billing and collection by TSPs. Let the two activities be treated at arm's length for equitable charges for one and all. The satellite operator should set up a subsidiary for provisions of services, should they wish to provide services to the consumers either via B2B model or B2C model.

- 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?

Club the activities of the in-orbit services like satellites, and the compatible ground segment as an activity for use by any licensed service provider under the ITA 1885 and its attendant amendments from time to time. With this approach, the quality-of-service agreement becomes responsibility of the satellite provider. The satellite service provider would understand his contractual obligation to deliver satellite capacity to TSPs. He would be responsible for any service level agreement. Routing of data and calls would be the responsibility of the TSPs.

- 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.

The question is bit misplaced. It should be left to arrangements between the satellite service infrastructure provider and the TSP as to at what level is the interface. The definition of base band requires a more clear definition. The ground station service provider should be able to provide at best a tap at intermediate frequency. At baseband level, he becomes a TSP to connect to switch for call routing. Please see response to Q4 above. Base band is an activity commensurate with traffic. It should be responsibility of TSP, whether collocated at ground station or their own facilities with Legal Intercept Equipment. (LIM)

- 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.

It would be better to create a separate provision on the lines of GMPCS services. Whereas in the case of GMPCS the ground segment is delinked from satellite capacity provider, in this case it is suggested that satellite capacity and ground segment should be the responsibility of the Satellite service provider. Any TSP would be authorised to share the facility on the basis of commercial agreement between them. By the by, INMARSAT has adopted this model in certain countries either directly or by arrangement.

- 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.

AS mentioned above in introduction the complexities in the ground segment, it would be prudent cost effective to make these facilities shareable as is the case in cable landing station where capacities are leased by TSPs. Similarly, airlines don't build airports specific to them, but share the facility as developed by a country in equitable manner

- 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.
- Q9. What should be the methodology for the assignment of spectrum for establishing satellite Earth Station? Provide a detailed justification.
- Q10. What should be the charging mechanism for the spectrum assigned to the satellite Earth Station licensee? Elaborate your answer with justification.

Questions 8 through 10 are clubbed. It is intriguing to delink spectrum for satellites and Ground Segment. The spectrum for ground station has to match satellite spectrum. Satellite spectrum in these cases appear to be pre-ordained for the likes of Space-x, OneWeb, Telesat, Kulper etc. Accordingly, the ground segment has to be matched. It is expected that the spectrum used by them is aligned to accepted principles of coordination with a country hosting them as per provisions of ITU radio Regulations. For example, in US, the FCC authorises the use of spectrum, orbital slots for various systems. It is not at all free for all. Therefore, the satellite capacity provider must follow the law of land to acquire landing rights of those spectrum for which they intend to build the ground segment. That acquisition of spectrum must be via a market discovered mechanism, and not distributed or doled out as mandated by Supreme Court judgement of 2012, as consequence of the 2G scam.

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

It is felt that there are complexities involved in the setting up of Compatible Ground Segment, depending upon the types of satellites, their orbits, and with or without inter-satellite links. Even in the GEO

scenario beam coverage would be determining factor for number of ground stations to be set up. Nonetheless, it would be better and safer should the two activities space segment and ground segment are clubbed together for better coordination, cost-effectiveness, and timely delivery of service (BANDWIDTH)).