

December 10, 2021

Telecom Regulatory Authority of India
Attention: Shri Syed Tausif Abbas
Advisor (Network, Spectrum & Licensing)
advmn@traf.gov.in

Reference: Consultation Paper No. 6 / 2021 (Licensing Framework for Establishing Satellite Earth Station Gateway; Comments of Globalstar, Inc.

Dear Sir,

Enclosed, please find the comments of Globalstar, Inc. on the Consultation Paper on Licensing Framework for Establishing Satellite Earth Station Gateway.

Globalstar is a leading provider of Satellite IoT Solutions for customers around the world in industries such as oil and gas, transportation, emergency management, government, maritime and outdoor recreation.

Thank you for giving us the opportunity to provide comments to this consultation paper.

Sincerely,

L. Barbee Ponder IV

L. Barbee Ponder IV
General Counsel and Vice President of Regulatory Affairs

COMMENTS OF GLOBALSTAR, INC.

Globalstar, Inc. (“Globalstar”) is pleased to provide comments in support of the consultation issued by the Telecom Regulatory Authority of India (“TRAI”) regarding a “Licensing Framework for Establishing Satellite Earth Station Gateway.”

Globalstar is a US publicly traded company (NYSE: GSAT) duly registered in the State of Delaware. It owns and operates a Low Earth Orbit (“LEO”) satellite system providing near global coverage, including India (“Globalstar System”). Founded in 1995, Globalstar has been providing mobile satellite services to the public for more than 20 years, having invested approximately US \$5 billion in its satellite network and ground operations during this period.

The Globalstar System consists of three separate components: (1) a constellation of LEO satellites, notified to the International Telecommunications Union (“ITU”) as HIBLEO-X by the Administration of France; (2) a global network of 30 gateway Earth Stations; and (3) mobile devices and terminals used by over 700,000 customers to meet their communications needs.

As Globalstar grows its mobile satellite business, it has embarked on a comprehensive global strategy to develop its direct presence and regulatory compliance in numerous countries around the world. India represents the single largest market that Globalstar has been previously unable to enter. It is Globalstar’s hope that this consultation results in the TRAI instituting regulatory reforms that permit its entry.

THE GLOBALSTAR SYSTEM

The Space Segment

The Globalstar constellation consists of non-geostationary orbit satellites (NGSO) that operate in 8 orbital planes equally spaced around the Equator at an inclination of 52° and an altitude of 1414 kilometers. This configuration of the constellation provides almost complete coverage of the planet, including India.



Figure 1. Globalstar's satellite constellation

Originally licensed by the FCC in 1995, Globalstar's second-generation constellation ("HIBLEO-X") was deployed by Globalstar and notified to the ITU by the French Administration in 2010. Using a transparent transponder architecture, Globalstar satellites apply proven technology to provide global coverage communications, providing fast switching and ensuring low latencies for voice and data communications.

Globalstar satellites operate in the Mobile Satellite Services (MSS) band, which is a global allocation enabling small hand-held devices with omni-directional antennas to connect directly with the satellites. Each satellite is equipped with multiple receivers and transceivers, making use of the spectrum assignments registered with the ITU by Globalstar in the C, L and S bands.

The transmitters and receivers are divided into 16 individual beams that are dynamically switched to ensure the management of interference and spectral efficiency.

The Ground Segment

The Globalstar System utilizes a unique "bent-pipe" architecture whereby the satellites "hear" and transmit data traffic between Globalstar's mobile terminals and a global network of gateway Earth Stations.

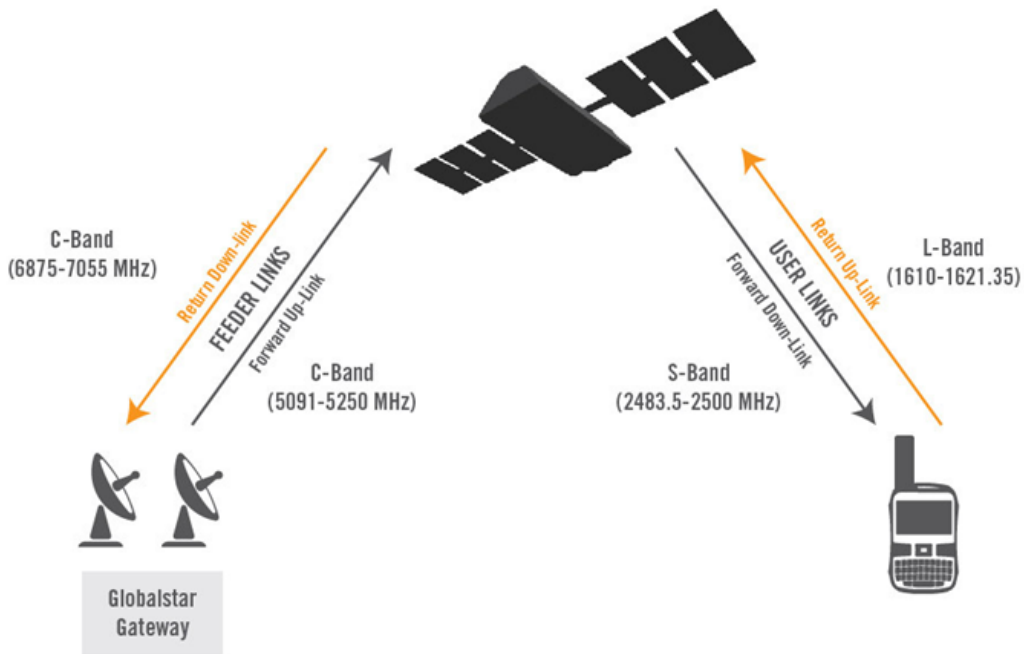


Figure 2. Description of the forward and return links and spectrum used by Globalstar

The Globalstar network currently utilizes 30 gateway Earth Stations around the world, each providing between 700,000 and 1 million square miles of coverage over the surface of the Earth.



Figure 3. Globalstar Gateway Ground Stations



Figure 4 Kilingi- Nõmme, Estonia Gateway

Globalstar Devices and Services

Globalstar has focused its products and services on individual consumer and commercial industrial applications. Unlike most satellite segment operators, which focus on wholesale capacity agreements with terrestrial segment resellers (such as VSAT operators), Globalstar achieves affordable prices and rapid service integration by avoiding complex supply chains.

Globalstar's MSS are delivered to consumers through user terminals designed primarily by Globalstar, offering a wide range of applications. SPOT products work virtually everywhere in the world, offering communication through satellite connectivity to hundreds of thousands of people who travel off the grid. SPOT users can track assets using SPOT Trace for anti-theft, use SPOT Gen4 and SPOT X for tracking, location-based messaging and signal an S.O.S. to get help. The entry-level device, the SPOT Gen4, is priced at US \$150.00 with an annual subscription cost of US \$163.35. Relative to Satellite Phone offers or even compared to VSAT capacity costs, these prices are significantly more affordable.

Globalstar's SPOT X provides 2-way satellite communications to stay connected to remote and lone workers who can check-in and provide detailed status of their situation when working at remote jobsites. SPOT X provides users with a unique, personal mobile number that allows either party to initiate conversations at any time. With the ability to communicate the nature of emergencies with emergency services, the SPOT X has led to more efficient rescues.

SPOT rescues have taken place in 89 countries on six continents around the world, including over approximately 90 in Asia.

Globalstar has also developed a range of products designed for Internet of Things (IoT) applications in a wide range of industries. For example, the SmartOne Solar device provides a low maintenance and cost-efficient tracking option powered by solar-rechargeable batteries that can deliver up to 10 years of life. The extended functionality can be used for wildlife monitoring and preservation, asset monitoring including shipping containers, transport trailers, construction/farm machinery, vehicle fleets and tracking for leisure boat owners.

The SmartOne C, transmits basic performance indicators of remote assets or assets in motion in real time, enabling commercial applications in shipping, supply chain management, oil and gas, and more.



Figure 5. Globalstar Product Line

Overall, Globalstar has distinguished itself for more than 20 years as the only operator in the consumer-centric satellite segment, providing essential services to hundreds of thousands of individuals and businesses.

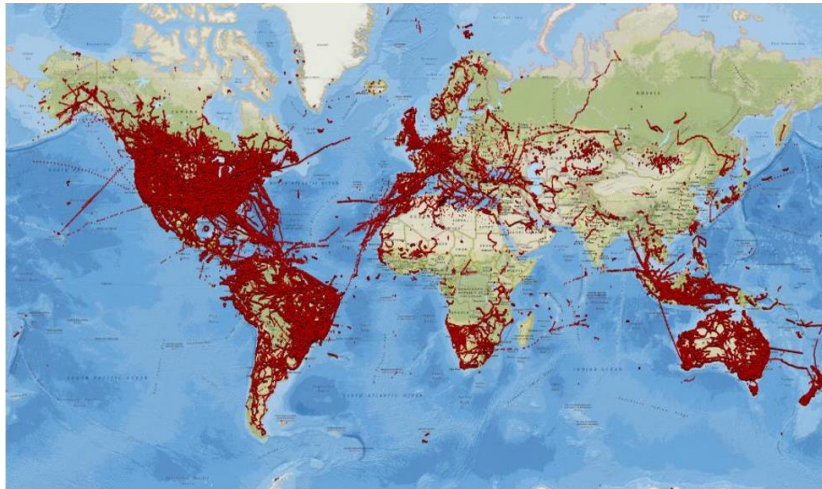


Figure 6. Map of traffic flowed via Globalstar

3. GLOBALSTAR'S RESPONSES TO THE SPECIFIC QUESTIONS

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.

Yes, the TRAI should establish a transparent regulatory framework for the issuance of specific licenses to satellite operators to establish Earth Station Gateways in India for the purpose of providing satellite-based resources to service licensees. Satellite operators such as Globalstar should be permitted to establish their own Earth Station Gateways in India that are under their direct ownership and control. The regulatory framework for such licensing of such Operator-owned Earth Station Gateways should provide a clear and efficient path for obtaining such licenses including application requirements, timeframe for issuance, and

any regulatory fees associated with the consideration of the application and issuance of the requested license.

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.

The license should include frequency assignments, permitting the Operator to transmit and receive communications to and from its satellites using ITU-allocated frequency bands for operations. The license should include a defined term for operations of at least 10 years and clearly specified reporting requirements and fee payments. Any fees charged for licensing such Earth Station Gateways should be set to an amount needed to recover the cost of the regulatory process for licensing and ongoing monitoring efforts during the license term.

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.

Globalstar is interested in owning and operating any Earth Station Gateway built in India intending to communicate with Globalstar's LEO constellation of satellites. Globalstar would establish a wholly owned subsidiary in India in order to apply for and receive the necessary licensing, as well as construct and operate the Gateway.

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?

In order for Globalstar to make the necessary investment in one or more Earth Station Gateways in India, it must have the assurance that service licenses will also be issued by India pursuant to an efficient and transparent regulatory process. Having satellite and gateway coverage over India is meaningless, if Globalstar's Mobile Satellite Services are unable to be commercially licensed in India.

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.

Yes, the TRAI should provide maximum flexibility to the Space Operator and Earth Station Licensee in order to reach commercial arrangements with service licensees, including the ability to install and operate baseband equipment for the provision of service.

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.

No Comment.

Q7. Whether the sharing of Earth Station among the licensees (between proposed Earth Station licensee and Service Licensee; 43 and among service licensees) should be permitted? Do provide the details with justification. And 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.

Globalstar, through its established local entity, would want to hold all licenses for the operation of the Earth Station, as well as the Mobile Satellite Services provided to end users in India. Under this arrangement, the frequency carriers covering both the feeder links and service links would be assigned to Globalstar, which would be consistent with how Globalstar operates in numerous other countries around the world.

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

The TRAI should follow established norms in the assignment of spectrum for establishing satellite Earth Stations. The TRAI should make available ITU-allocated frequency bands designated for Fixed Satellite Services (“FSS”), including the 5091-5250 MHz and 6875-7055 MHz assignments that Globalstar has used for over 20 years globally to provide Mobile Satellite Services.

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

In order to ensure that end user pricing for Mobile Satellite Services remains as affordable as possible, the TRAI should endeavor to charge licensees only those amounts necessary to cover the cost of actually regulating the licensee’s activities.

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

No comment.