Globalstar *Connect smarter*

31 July 2024

To,
Telecom Regulatory Authority of India
Advisor (Networks, Spectrum and Licensing)
advmn@trai.gov.in

Attention: Shri Akhilesh Kumar Trivedi

Subject: Comments from Globalstar, Inc. on Consultation Paper No. 7 / 2024 on the Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023

Dear Sir,

We have enclosed comments of Globalstar, Inc. on the Consultation Paper on the Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023 for your perusal.

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

Sincerely,

Globalstar, Inc.

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

Globalstar Connect smarter

ANNEXURE

1. COMMENTS OF GLOBALSTAR, INC.

1.1. Globalstar, Inc. ("**Globalstar**") appreciates the opportunity to provide comments in support of the consultation paper issued by the Telecom Regulatory Authority of India ("**TRAI**") regarding the Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023 ("**Consultation Paper**").

1.2. 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 ("**MSS**") to the public for more than twenty years, having invested approximately US $5 billion in its satellite network and ground operations during this period.

1.3. The Globalstar System consists of three separate components: (i) a constellation of LEO satellites, properly notified to the International Telecommunications Union ("**ITU**"); (ii) a global network of 28 gateway Earth Stations located in eighteen countries; and (iii) mobile devices and terminals operating over Globalstar's MSS network, including those used by over 780,000 of Globalstar's own end-user customers in over 120 countries worldwide to meet their communications needs.

1.4. In a significant breakthrough, Apple Inc. in 2022 announced a revolutionary, direct-to-handset "Emergency SOS *via* satellite" feature using Globalstar's MSS network that is now available to users of the iPhone 14 and 15 family of devices in certain countries. Apple's Emergency SOS *via* satellite feature allows users to initiate emergency communications through MSS transceivers contained in the Apple iPhone 14 and 15 family of devices. This satellite-enabled feature is now available in the US, Canada, twelve European countries, Australia and New Zealand and most recently Japan, with more nations to be added in the coming months. The iPhone 14 and 15's Emergency SOS *via* satellite feature is being used daily to request emergency assistance in the markets where the feature has been introduced.

1.5. As Globalstar grows its satellite communication 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 ease its proposed entry in India.

2. THE GLOBALSTAR SYSTEM

2.1 The Space Segment

The Globalstar constellation consists of non-geostationary orbit ("NGSO") satellites that operate in eight 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 in the US by the FCC for a first-generation constellation ("HIBLEO-4") in 1995, Globalstar's second-generation constellation ("HIBLEO-X") was deployed by Globalstar and notified to the ITU by the French Administration in 2010. Globalstar has also contracted for the procurement of 17 new satellites that will replenish its US-licensed HIBLEO-4 constellation. Using a transparent transponder architecture, Globalstar satellites apply proven technology to provide global coverage communications, providing fast switching and ensuring low latencies for data communications.

Globalstar satellites operate in MSS spectrum allocated in the L and S bands. This spectrum 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 L and S bands, as well as in the C band for communications with Gateway Earth Stations.

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.

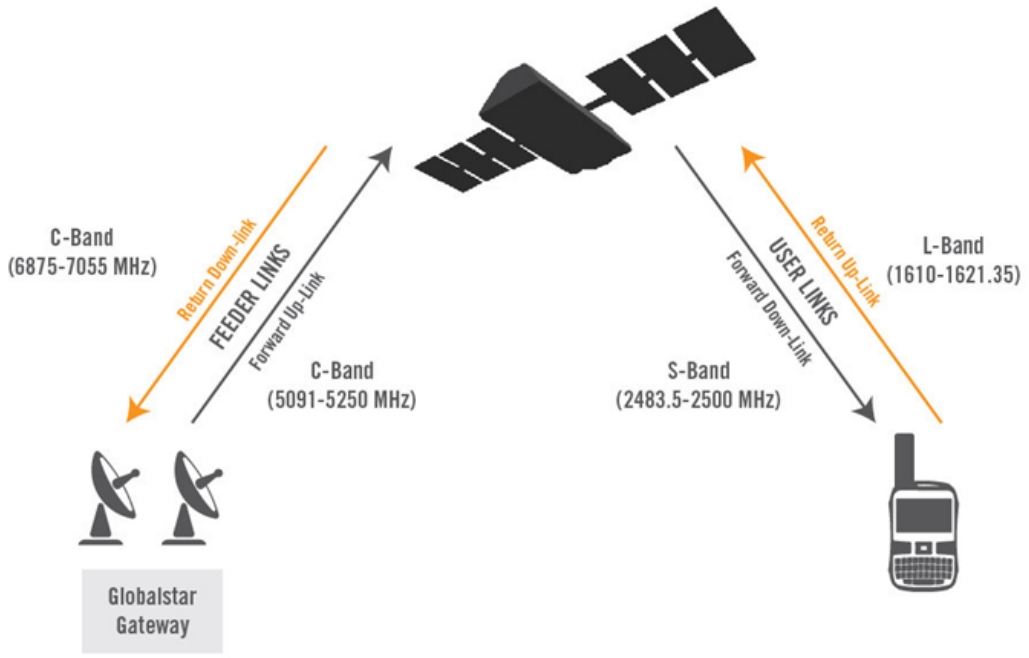

Figure 2. Description of the forward and return links and spectrum used by Globalstar

Globalstar has in recent years made a substantial investment in the enhancement and expansion of its global ground infrastructure. Globalstar has upgraded all of its existing gateway Earth Stations through the deployment of second-generation feeder link antennas and has extended its MSS service footprint with the addition of ten new gateway Earth Station locations around the world. Overall, Globalstar's MSS network currently utilizes 28 gateway Earth Stations worldwide in eighteen countries, with each providing between 700,000 and 1 million square miles of coverage over the surface of the Earth. Globalstar expects to continue its ground infrastructure expansion well into the future.

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.

As indicated above, during 2022 there was a significant breakthrough relating to the use of Globalstar's MSS network for consumer-oriented applications. In November 2022, Apple's transformative, direct-to-handset "Emergency SOS via satellite" feature became available to users of the iPhone family of devices for the first time over Globalstar's MSS network in the United States and Canada. The availability of Apple's satellite-enabled feature has since been extended to twelve European countries, Australia and New Zealand, as well as, most recently Japan. More nations will be added in the coming months. The Emergency SOS via satellite feature enabled via Globalstar's licensed MSS frequencies allows users to initiate emergency communications through MSS transceivers contained in the Apple iPhone devices. This feature is now being used daily and has already resulted in multiple lifesaving rescues since its launch. With Apple iPhone devices having the potential through the Emergency SOS via satellite feature to use Globalstar's network for emergency communications in numerous countries around the world, Globalstar's L- and S-band spectrum will be the most widely available and intensively utilized MSS frequency bands in existence.

Globalstar's MSS services are also delivered to consumers through dedicated MSS user terminals designed primarily by Globalstar, offering a wide range of applications. Globalstar's affordable and innovative "SPOT" family of MSS devices has since 2007 played a critical role in providing emergency and safety-of-life services to individual consumers beyond terrestrial wireless reach. Globalstar's 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 and can use SPOT Gen4 and SPOT X for tracking, location-based messaging, and S.O.S. signaling 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 two-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.

In total, more than 9,500 SPOT rescues have taken place in over 80 countries on six continents around the world, including over 90 rescues in Asia.

Globalstar's MSS network can also provide critical back-up capabilities for public safety personnel during disasters, when terrestrial networks can be rendered inoperable. In situations where all

terrestrial wireless facilities are down in an affected area, Globalstar's global MSS network will continue to function normally. Public safety entities involved in relief efforts around the world have relied on Globalstar's satellite services after earthquakes, hurricanes, and other disasters.

In addition, Globalstar has developed an array of products for Internet of Things ("IoT") applications in a wide range of industries, including oil and gas, mining, construction, transportation, agriculture, emergency management, government, maritime, and commercial fishing. Globalstar's satellite IoT products allow enterprises to streamline their operations and intelligently manage, monitor, and track their mobile assets remotely via Globalstar's MSS network. Globalstar's commercial IoT products include its SmartOne asset tracking solutions and IoT satellite transmitters, which enable its customers to manage their remote assets utilizing motion sensors, comparative GPS positions, and custom-configured sensors.

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 ten years of life. The extended functionality can be used for wildlife monitoring and preservation, tracking for leisure boat owners, and asset monitoring including shipping containers, transport trailers, construction/farm machinery, and vehicle fleets. 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 twenty years as the only operator in the consumer-centric satellite segment, providing essential services to hundreds of thousands of individuals and businesses.

Further, looking to the future, Globalstar is well-positioned to take advantage of the 3GPP Release 18 specification, whereby its L and S-band frequencies are being considered for adoption. When adopted, Globalstar will be uniquely positioned to augment cellular communication with our satellite coverage for emergency, IoT and other low-data use cases.

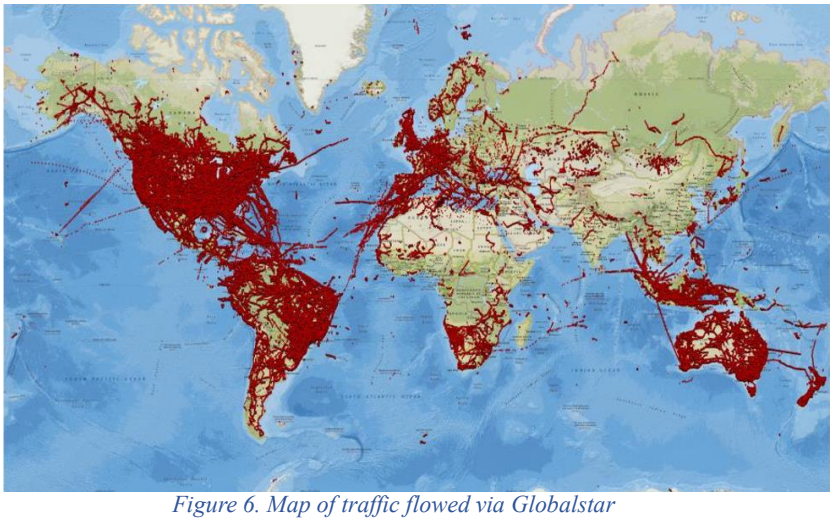

Figure 6. Map of traffic flowed via Globalstar

3. GLOBALSTAR'S RESPONSES TO THE SELECT QUESTIONS

3.1. Q 9. Whether there is need for merging the scopes of the extant GMPCS authorization and Commercial VSAT CUG Service authorization into a single authorisation namely Satellite-based Telecommunication Service authorisation under the Telecommunications Act, 2023? Kindly provide a detailed response with justifications.

Response: We welcome TRAI's proposal to merge the GMPCS authorization and Commercial VSAT CUG Service authorization into a single authorization under the Telecommunications Act, 2023 ("**Telecom Act**"). This will help streamline the authorization regime with respect to satellite-based communication services under one umbrella, ease of doing business and provide choice to authorized entities to offer GMPCS service and/or the VSAT-CUG service to their users based on their operational and business requirement, without requiring to apply for a new authorization in the future. It is our submission that as discussed below in Para 3.4, the entry fees (and any other authorization-related fee) under the merged authorization should not be over and above the current entry fees and other fees currently payable for GMPCS and VSAT-CUG service, whether singly or jointly.

3.2. ***Q 10. In case it is decided to merge the scopes of the extant GMPCS authorization and Commercial VSAT CUG Service authorization into a single authorisation namely Satellite-based Telecommunication Service authorisation under the Telecommunications Act, 2023, -***

(a) What should be the scope of service under the proposed Satellite-based Telecommunication Service authorisation?

(b) What should be terms and conditions (technical, operational, security related, etc.) that should be made applicable on the proposed Satellite-based Telecommunication Service authorisation?

(c) Any other suggestion to protect the reasonable interests of other authorised entities upon the introduction of such an authorisation?

Kindly provide a detailed response with justifications.

Response: Upon merging, the single authorization should allow authorized entities to provide both satellite-based public telecommunication services (public telephony and public internet) and non-public non-captive services (data connectivity within a closed user group), as per their operational needs.

To effectively merge the two authorizations and to promote expansion of satellite communication industry in India, we find it beneficial to move towards a mature regulatory regime that allows authorized entities to inter-connect gateway and network for provisioning GMPCS and VSAT-CUG services to its public and non-public non-captive users, respectively. Specifically, under the extant terms and conditions of the unified license for these subject services, while a GMPCS authorized entity is required to establish a land earth station gateway, and a VSAT CUG authorized entity is required to operate and maintain a VSAT Hub Station. Further, a VSAT CUG authorized entity is restricted from interconnecting the VSAT network with the GMPCS network. To the extent possible, these differences should be re-assessed and, in our view, done away with so that an entity seeking a common authorization is not subject to extensive operational and financial constraints by having to set up a dual infrastructure and network for providing both the services contemplated under the common authorization.

We understand that any proposed removal of differences amongst the GMPCS and VSAT-CUG authorization as mentioned above must be considered in light of operational requirements applicable to each service and, therefore, if possible, allow inter-connection to the extent GMPCS authorisation will be used by authorized entity to provide data communication services only. In the event TRAI considers that such applicable requirements make it challenging to provide a common technical and operational framework under the common authorization, then we request TRAI to permit that an entity providing only GMPCS service under the common authorization should be subject to technical and operational conditions applicable to such service. Similar position should apply for a standalone VSAT-CUG provider.

3.2. Q. 23. In view of the provisions of the Telecommunications Act, 2023 and market developments, whether there is a need to make some changes in the respective scopes and terms and conditions associated with the following service authorisations, recently recommended by TRAI:

(a) …
(b) …
(c) …
(d) Satellite Earth Station Gateway (SESG) License

If yes, kindly provide a detailed response with justifications in respect of each of the above authorisations.

Response: Under the current licensing regime, there is no specific provision for the establishment of satellite earth station gateway by satellite operators for providing satellite-based resources to

authorized entities. We understand from the TRAI's proposal that the installation and operation of land earth station gateways be delinked from GMPCS authorization and be treated as a separate authorized activity. This may help the satellite industry by allowing gateway providers to provide their services to telecommunication and broadcast service providers, on an independent basis.

We believe that the deployment of land earth station gateway is a capital-intensive task and it may not be economically sustainable for many authorized entities to establish individual gateways for providing the services to end customers. By enabling a separate authorisation for the establishment of land earth station gateways, such capital-intensive task can be undertaken by satellite operators and 'gateway as a service' can be provided to authorized entities – which will also lead to optimum utilization of the infrastructure.

Separately, Globalstar's satellites operate in the NGSO, where satellites are constantly moving, and each user station needs to switch to multiple satellites and do a hand-off without losing the connection. Therefore, a requirement for the installation of more than one land earth station gateway may arise for the GMPCS authorized entity. Therefore, Globalstar hopes that TRAI adopts a separate authorisation for the establishment and operation of earth station gateways which in turn will provide more options to a GMPCS authorized entity to either establish its own gateway or obtain 'gateway as a service' from authorized entities.

Separately, Globalstar is keen on establishing a wholly owned subsidiary in India for which we propose to apply for a GMPCS authorization. Under such authorization, we will establish a land earth station gateway(s). We expect that no new or onerous requirements will be imposed upon GMPCS authorised entity, as a result of introducing a new satellite earth station gateway license, as mentioned above.

3.3. Q. 29 What amendments are required to be incorporated in the terms and conditions of authorisations for providing telecommunications services using satellite-based resources in light of the policy/Act in the Space Sector? Kindly provide a detailed response with justifications.

Response: The Indian government had issued the new Indian Space Policy in 2023. Pursuant to the same, the Indian National Space Promotion and Authorization Centre of Department of Space ("**IN-SPACe**") has issued the Norms, Guidelines and Procedures for Implementation of Indian Space Policy-2023 in respect of Authorization of Space Activities ("**NGP Guidelines**"), that allows private entities to offer national and international space-based communication services, through self-owned or procured or leased GSO/NGSO communication satellites.

While IN-SPACe will accord authorization for the establishment and/or operations of space-based object(s) (which includes communication satellites), the use of such authorized space object(s) for providing satellite communication services is additionally governed by the Telecom Act, and rules, regulations and policies of Department of Telecommunication ("**DoT**"). To clarify, till such time the Telecom Act is fully notified, the provision of satellite communication services is governed by Indian Telegraph Act, 1885.

In view of the above, this requires an alignment between the provisions of the extant unified licensing regime and the NGP Guidelines. Our para wise suggestion in this regard is provided below:

(i) the NGP Guidelines allow an overseas entity to obtain authorization (through its Indian subsidiary with majority foreign directors on its board) for making use of non-Indian NGSO LEO satellite / satellite constellation, to enable provisioning of such satellite capacity in India, however, the telecommunication laws do not allow an overseas company or its subsidiary with majority foreign directors on its board to apply for license / authorization with DoT; and

(ii) under the unified license, an entity proposing to obtain the GMPCS authorization is required to disclose complete details of terms and conditions of contracts/licenses entered into with its space segment/satellite system owner/operator. A similar condition exists under the NGP Guidelines where the applicant entity is required to submit documentary evidence on the authority granted by or contractual relationship (if any) with the satellite operator. Given that the GMPCS terms states that the authorization for space segment is to be obtained from the Department of Space as per applicable terms and conditions, the aforementioned obligation of submitting the same set of documents in connection with space segment to two different departments becomes obsolete. Therefore, to the extent necessary, such terms should be done away with under the unified license to support ease of doing business.

We suggest for the above authorization conditions to be amended to bring them in line with the NGP Guidelines. Such alignment changes can be introduced under the rules to be issued under the Telecom Act, which will phase out the unified licensing regime.

3.4. Q. 39. In case it is decided to merge the scopes of the extant GMPCS authorization and Commercial VSAT CUG Service authorization into a single authorization namely Satellite-based Telecommunication Service authorization under the Telecommunications Act, 2023, what should be the: -

(i) Amount of application processing fees
(ii) Amount of entry fees
(iii) Provisions of bank guarantees
(iv) Definitions of GR, ApGR and AGR
(v) Rate of authorisation fee
(vi) Minimum equity and net worth of the Authorised entity

Please support your response with proper justification.

Response: As per the existing unified license regime, an authorized entity is required to pay a one-time non-refundable application processing fee and entry fee, furnish appropriate performance bank guarantee and financial band guarantee for obtaining a service authorisation under the unified license. In addition, authorised entities must pay an annual license fee as a percentage of adjusted gross revenue ("**AGR**") in installments and pay spectrum charges, etc., for each service authorization. The fees (such as entry fee) and bank guarantee amount differ depending on the number of services for which an entity is obtaining authorization under the unified license.

For instance, a GMPCS authorized entity is required to pay INR 10,000 (as application processing fee) & INR 1,00,00,000 (entry fee) and furnish INR 20,00,000 (financial bank guarantee) & INR

50,00,000 (performance bank guarantee). Whereas a VSAT CUG authorized entity is required to pay INR 10,000 (as application processing fee) & INR 30,00,000 (entry fee) and furnish INR 600,000 (financial bank guarantee) & INR 10,00,000 (performance bank guarantee).

It is pertinent to note that TRAI in its recommendations to Department of Telecommunications on September 19, 2023, with respect to the consultation paper on 'Recommendations on Rationalization of Entry Fee and Bank Guarantees' had not suggested any change in the entry fee for GMPCS authorization and has suggested a minor change in VSAT CUG authorization.

We suggest that any entity desirous of undertaking only GMPCS services under the common authorization should not be subject to additional fees or higher bank guarantees. In other words, the cost of obtaining the common authorization should be same as it is today for a GMPCS authorization.

Similarly, if the cost of providing both GMPCS and VSAT-CUG authorization under the common authorization should remain the same as applicable for combined offering of such services as on date.

Additionally, we propose that:

(i) the entry fee and AGR fees paid by GMPCS authorized entities offering emergency satellite communication services should be subject to concessions, in view of the essential support provided by such providers across networks, especially for emergency and disaster management workers.

(ii) Authorized entities should be required to pay AGR fees only in connection with revenue operations that are directly arising from their telecom activities. Activities that are ancillary to telecom activities should be expressly deducted from Applicable Gross Revenue, for arriving at the payable AGR. This will enable authorized entities to enable cost-effective and efficient operations in India, which will directly benefit end-consumers, particularly in remote areas where satellite communications and internet services will greatly aid internet expansion across India.

We hope the above suggestions will be reviewed and reflected upon by TRAI, for the purpose of framing its proposed framework in respect of the subject matter.