

Ref. No. SIA-India/TRAI CP-13/2024/2024

25th October 2024

To

Shri Akhilesh Kumar Trivedi
Advisor (Networks, Spectrum and Licensing)
TRAI, Mahanagar Doorsanchar Bhawan,
Jawahar Lal Nehru Marg, New Delhi- 110002

Sub: SIA-India comments on TRAI Consultation Paper No. 13/2024 dated 27-09-2024 on the Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services.

Dear Sir,

The Satcom Industry Association (SIA-India) is a non-profit organisation formed to represent the interests of the satellite industry at large ensuring that the industry benefits from the appropriate political, industrial and regulatory environment to fulfil their vital role in the efficient and ubiquitous delivery communication services in India. Satellites are an established and important technology for delivering telecommunications, broadband and media services and support economic development, social objectives, and national, regional and regional integration.

With reference to TRAI Consultation Paper No. 13/2024 dated 27-09-2024 on the Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services, SIA-India is pleased to respond to this consultation and our comments are provided at Annexure-1.

We are sanguine that TRAI recommendations to this consultation will ensure long-term stability to sustain and augment the satellite ecosystem in the country as well as have a major influence on the capabilities of the Indian space industry to meet its growth objectives and contribute significantly to accrue socio-economic benefits.

Yours sincerely,

Encl: as above



Anil Prakash
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Annexure-1

SIA-India Comments to TRAI Consultation Paper No. 13/2024 dated 27-09-2024 on the Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services

SIA-India is a non-profit organisation established with the objective of serving and promoting the common interests of the satellite communication ecosystem in India.

As a trade association, we strongly articulate the need for certainty in the satellite industry, which is absolutely vital to attract investments and ensure continued development of existing and new satellite capabilities to benefit country at large and the Indian society in particular.

With this in mind, the SIA-India is pleased to provide comments to this CP as under:

1. Which frequency band(s)/ range(s) should be considered for the assignment to NGSO based Fixed Satellite Services for providing data communication and Internet service? Please provide a detailed response separately for the user link and feeder link.

Satellites have played a pivotal role in the connectivity ecosystem for decades. Satellites provide seamless communication across remote and underserved areas. Their ability to provide ubiquitous coverage ensures that even the most isolated areas remain connected, helping to bridge the digital divide. Therefore, reliable, adequate and continued access to spectrum and orbital resources are vital for satellite services to meet the evolving commercial, civil and military needs.

Hence, it is essential that these scarce resources are carefully managed to ensure that all needs for satellite-based services can be met to provide a multitude of applications viz. remote sensing/earth observation, science, defence, position, navigation and timing, communications, etc.

It is proposed that all satellite constellations have equal access to the spectrum, which are vital in sustaining the satellite industry to its full potential so as to tap overall socio-economic benefits in India. Accordingly, following GSO/NGSO FSS and MSS frequency ranges for service and feeder links are necessary:

Band	Frequency Range	Direction	Service Type Allocation
L-band	1.525-1.559 GHz	Space-to-Earth	MSS
	1.610-1.6605 GHz	Earth-to-space	
S-band	2.170-2.200 GHz	Space-to-Earth	MSS
	2.4835-2.520 GHz		
	1.980-2.010 GHz 2.670-2.690 GHz	Earth-to-space	
C-band	3 400-4 200 MHz	Space-to-Earth	FSS frequency band not subject to ITU space plans
	5 850-6 725 MHz 7 025-7 075 MHz	Earth-to-space	
	4 500-4 800 MHz	Space-to-Earth	FSS frequency band subject to ITU space plans (RR Appendix 30B)
	6 725-7 025 MHz	Earth-to-space	
Ku-FSS	10.7- 12.75 GHz	Space-to-Earth	FSS frequency band not subject to ITU space plans; Ku-band NGSO
	13.75-14.5 GHz	Earth-to-space	
	10.7-10.95 GHz	Space-to-Earth	FSS frequency band subject to ITU space plans (RR Appendix 30B); Ku-band NGSO
	11.2-11.45 GHz		
	12.75-13.25 GHz	Earth-to-space	
Ku-BSS	11.7-12.2 GHz	Space-to-Earth	FSS frequency band subject to ITU space plans (RR Appendix 30); Ku-band NGSO
	14.5-14.8 GHz 17.3-18.1 GHz	Earth-to-space	
Ka-band	17.8-18.6 GHz/ 18.8-20.2 GHz	Space-to-Earth	NGSO FSS Feeder and Service Links
	27.5-29.1GHz/ 29.5-30.0 GHz	Earth-to-space	
Q/V-band	37.5-42.5 GHz	Space-to-Earth	FSS frequency band not subject to ITU space plans
	47.2-51.4 GHz (except 50.2-50.4 GHz)	Earth-to-space	

In India, multiple satellites use various portions of these bands to deliver Internet and broadband connections countrywide including connectivity to remote and sparsely populated areas, and to expand the coverage of 4G (and soon 5G) mobile networks.

These Ku- and Ka- band frequencies are also used for live news gathering, direct-to-home (DTH) satellite TV, and the distribution of popular Indian and foreign content channels. ISRO also use these bands for critical and strategic purposes by the government departments/agencies.

The pathbreaking slew of proactive measures unveiled by the Government since last year promise to boost the nascent satellite industry in India to its full potential and thereby help to bridge the digital divide and empower the marginalized citizens living in remote and rural corners of the country. Given the context, it is prudent that the satellite sector is granted access to the entire satellite Ka-bands¹ to serve India in a cost-effective manner.

Furthermore, SIA-India earnestly appeal that 27.5-28.5 GHz band should be exclusively allocated for satellite services. The allocation of the satellite Ka-band has already been harmonised in the vast majority of countries around the world for Ultra High Throughput Satellite systems, particularly for use by ubiquitous FSS and Earth Stations in Motion (ESIM), while using the globally harmonized 26 GHz for IMT. As a result, India will benefit more from maintaining a harmonised used of the Ka band.

The satellite industry needs long-term certainty regarding access to harmonised spectrum to ensure the necessary investment and continued development of existing and new satellite capabilities. It is therefore essential that the governmental policy and approach facilitate access to sufficient spectrum and adequately protect them from harmful interference from other spectrum users

2. Which frequency band(s)/ range(s) should be considered for the assignment to GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet service. Please provide a detailed response separately for the user link and feeder link.

SIA-India:

In addition to our comments to Q-1 above, following may also be noted:

User links:

3GPP Band Class	Space-to-Earth	Earth-to-space
n256	2170 MHz – 2200 MHz	1980 MHz – 2010 MHz
n255	1525 MHz – 1559 MHz	1626.5 MHz – 1660.5 MHz
n254	2483.5 MHz – 2500 MHz	1610 MHz – 1626.5 MHz

These bands are globally harmonized for use by MSS on a primary basis, enabling standardized 3GPP based solutions with global economies of scale and capability for full integration with mobile networks to achieve ubiquitous connectivity.

¹ 27.5 – 29.1/29.5 – 30.0 GHz (Earth-to-space) and 17.8 – 18.6/18.8 – 20.2 GHz (space-to-Earth)

3. What should be the maximum period of assignment of spectrum for - NGSO based Fixed Satellite Services for providing data communication and Internet services, and
 - a. GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?
 - b. Please provide a detailed response along with international practice in this regard.

To ensure certainty in continuity of satellite services and reduce administrative overheads, SIA-India is of the view that the spectrum authorization regime should be consistent to the validity of the service authorisation of up to 20 years or co-terminus with the Unified License for NGSO based FSS and GSO/ NGSO based MSS and permitting renewal, as per requirements.

This will provide sufficient certainty to service providers for recovery of their capital investments. Another reason for a longer period of validity would be since Satellite-based broadband services are, at present, in a nascent stage of development, and their business potential would emerge after some years of operations; the policy and regulatory environment should be stable and certain, to give investors sufficient confidence to plan and monetise their investments.

4. For assigning spectrum for NGSO-based communication services, whether every ITU filing should be treated as a separate satellite system? Please provide a detailed response along with international practice in this regard.

IN-SPACE has already formulated the Norms, Guidelines and Procedures for implementation of the Indian Space Policy 2023 in respect of Authorization of Space Activities (NGP) in May 2024. In our opinion, the detailed IN-SPACE guidelines on ITU filings would suffice. However, the spectrum needs to be assigned on a per IN-SPACE authorization basis.

ITU filings for multiple orbital locations are often a requirement for new satellite networks. This is because the congestion in the satellite bands means it is often impossible to determine the best location for a new satellite and several options have to be explored during the coordination process. This inevitably means some filings are never used, but is necessary to ensure operators have the flexibility to reduce the risk associated with coordination of new networks. The ITU cost recovery fees have already provided a very effective incentive for operators to minimise the number of filings. Therefore, NGSO satellites could be supported by several ITU satellite filings. A new

satellite filing may be submitted when additional satellites are launched to augment the existing capacity of the existing NGSO filings.

In view of the above, SIA-India is of the view that every ITU filing should not be treated as a separate satellite system.

5. Whether the provisions of ITU-RR are sufficient to resolve interference related challenges and coordination issues? If not, what additional conditions should be prescribed while assigning frequency spectrum for –

c) NGSO based Fixed Satellite Services for providing data Communication and Internet services; and

d) GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

Please provide a detailed response along with international practice in this regard.

SIA-India:

Article 22 framework of the Radio Regulations addresses space services and defines hard limits with respect to equivalent power flux density (EPFD) to protect GSO Earth station and satellite receivers from the aggregate emissions of NGSO FSS networks, together with reference antenna patterns. EIRP limits (as a function of off-axis angle) are also provided for earth stations operating in GSO-FSS networks in Ku- and Ka-band frequencies.

Furthermore, the algorithm specified by Recommendation ITU-R S.1503-4² provides a functional description of the software for use by the ITU-BR to conduct examination of NGSO-FSS system notifications for their compliance with the validation limits specified in the Radio Regulations

Thus, EPFD limits enshrined in Article 22 of RR remains as a basis for the efficient use of the GSO/NGSO shared Ku and Ka band frequencies, wherein the NGSO systems are freely able to operate globally without adversely affecting use by the GSO networks. Upholding these hard limits guarantees a stable and level playing field for all the stakeholders. It also helps maintain the delicate balance necessary to have a win-win situation in the satellite industry.

² Functional description to be used in developing software tools for determining conformity of non-geostationary-satellite orbit fixed-satellite system networks with limits contained in Article 22 of the Radio Regulations, Approved in 2023-09.

In view of the above, SIA-India opines that the existing ITU-RR provisions, which are current international practice, are sufficient to resolve interference related challenges and coordination issues.

6) For satellite earth station gateways of different satellite systems operating in the same frequency range, whether there is a need to prescribe a protection distance or any other measures to avoid interference from each other–

c) Between the gateways of GSO and NGSO systems; and

d) Between the gateways of NGSO systems?

If yes, please provide a detailed response along with international practice in this regard.

SIA-India: It is our understanding that the interference is unlikely to happen between two GSO earth stations and or between a GSO and a NGSO earth station due to extremely directional nature of GSO systems as well as strictly adhering to Article 22 of RR provisions.

On the contrary, interference may occur between two NGSO networks due to the use of physically or electronically steerable antennas operating at lower elevation angle. However, this can be very well managed through sufficient geographic separation and implementation of mitigation techniques such as avoidance angle or site-shielding. In such scenario, since adequate information on the appropriate measures needed to prevent the interference between two earth stations may be difficult for the licencing authorities, it is prudent that the authorities encourage and support the concerned satellite operators themselves to faithfully coordinate, negotiate and implement mitigation measures to remove any reported interference. In the case of two NGSO networks, interference can be managed between the concerned satellite operators to coordinate, negotiate and implement mitigation measures to avoid any harmful interference

In this regard, the authorization process could include sufficient and workable measures to facilitate satellite operators' coordination by clearly defining the rights and responsibilities of each party.

Since the number of antennas make little difference to the interference environment and opportunities for others to use the same spectrum, SIA-India opine that a single licence would suffice for operating multiple antennas at the same site.

7. In case the spectrum assigned for satellite gateway links is also assigned to terrestrial networks such as Fixed Service, IMT etc., what protection distance or criterion should be included in the terms and conditions of the assignment of spectrum for satellite gateway

links to avoid any interference to/ from terrestrial networks? Please provide a detailed response along with international practice in this regard.

SIA-India:

Several ITU-R studies continue to indicate that sharing between FSS and IMT is not feasible and will put undue constraints on the FSS either in terms of deployment type or receiving interference. The current limits in sections I and II of Article 21 of RR do not provide a defined or satisfactory protection of receiving satellites from transmitting terrestrial stations, including IMT stations.

Furthermore, there is no frequency coordination procedure between transmitting terrestrial stations and receiving satellites. Hence, a revision is required to ensure protection of receiving satellites from transmitting terrestrial stations (FS/IMT). However, such a revision will be a controversial process and also the timeline could not be predicted. Any gateway siting restrictions are also unnecessary because the gateways are coordinated and shielding is applied.

The presence of IMT terminals or other services including satellite user terminals in the vicinity of the gateway locations could create potential interference. Instead of coordination threshold, adoption of a power flux-density (PFD) threshold or another technical threshold for such coordination will be effective.

In the case of the 28 GHz, IMT was not identified in this band. However, Task Group 5/1 conducted terrestrial sharing studies on the 26 GHz band for WRC-19. The results of the studies³ showed possible separation distance of up to 10 KM between FSS earth station and IMT station.

While the sharing studies are solely based on the 26 GHz, it is expected for this separation distance to be lesser than those reflected in TG5/1 in the case of the higher attenuation of Radio Frequency signals in the 28 GHz.

The para 3.21 of the TRAI-CP mentions that the frequency spectrum 12.75-13.25 GHz is assigned for microwave access (MWA) service for cellular backhaul. However, it is our understanding that the FS allocation in this band is restricted to point-to-point FS links and not point-to-multipoint links which is where IMT technology is normally adopted. In fact, there has been extensive studies which showed that using PtMP links in this band would impact not only other FS PtP links but also FSS services.

Given the context, SIA-India is of the considered opinion that sharing the satellite bands with FS/IMT should not be considered as far as practicable. In case sharing is unavoidable, then IMT licence may be issued on non-protected and non-interference basis vis-à-vis transmitting earth station.

³ Please refer to [CPM19-2 report](#) page 172 Section 2/1.13/3.2.1.3

8. In case the spectrum assigned to the satellite user link is also assigned to terrestrial networks such as Fixed Service, what criterion should be included in the terms and conditions of the assignment of spectrum for satellite user links to avoid any interference to/ from terrestrial networks? Please provide a detailed response along with international practice in this regard.

SIA-India:

For the case of fixed VSATs, they can be individually coordinated with the FS.

For the case of ESIM, sharing conditions could be adopted from relevant resolutions from the outcomes of previous WRCs such as Res **123 (WRC-23)** and Res **169 (WRC-19)** for protection of terrestrial services in the Ka-band.

9. Whether there is a need to prescribe any conditions to mitigate the risk of scarcity of satellite gateway sites? If yes, please provide a detailed response along with international practice in this regard.

SIA-India: There should not be a need to prescribe any conditions to mitigate the risk of scarcity of satellite gateway sites.

Contrary to Paragraph 3.32 of TRAI-CP, there is no need for a predefined minimum distance as this should be determined between operator to define during the coordination process.

10. In addition to the roll-out conditions recommended by TRAI for satellite-based Telecommunication Service Authorisation through its recommendations on the Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023 dated 18.09.2024, whether there is a need to impose certain additional roll-out obligations for the assignment of frequency spectrum for –

(c) NGSO based Fixed Satellite Services for providing data communication and Internet services;

(d) GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

Please provide a detailed response along with international practice in this regard.

SIA-India: TRAI has already delineated explicit roll out conditions in its Recommendations on the Framework for Service Authorisations to be Granted Under the

Telecommunications Act, 2023 dated 18-09-2024. However, as an act of fair play, the roll out obligations should invariably consider an exceptional circumstances (force majeure/act of God) clause to deal with situations beyond the control of the licensee.

Furthermore, the roll out obligations are to be met within 24 months from the date of assignment of frequency assignment subject to issuance of relevant Authorization as well. Any delay in issuing administrative authorization should be taken into consideration for levying LD charges.

Lastly, satellite operators, differently from terrestrial mobile networks can share spectrum.

As such, SIA-India is of the view that there is no need to impose any further additional roll-out obligations for the assignment of frequency spectrum.

11. Whether there is a need to introduce a provision for surrender of frequency spectrum prior to the expiry of the period of validity of spectrum assigned for –

c) NGSO based Fixed Satellite Services for providing data communication and Internet services;

d) GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

If yes, what should be the process, and associated terms and conditions such as minimum period of spectrum holding, notice period, surrender fee, etc.? Please provide a detailed response with justifications.

SIA-India: A provision for surrender of frequency spectrum no longer in-use by the operator prior to the expiry of the period of validity is absolutely necessary and pragmatic.

12. Whether there is a need to prescribe timelines for processing the applications for the assignment of frequency spectrum for-

(c) NGSO based Fixed Satellite Services for providing data communication and Internet services;

(d) GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

Please provide a detailed response with justifications.

SIA-India: Prescribing timelines from the time accepting the full application and granting Authorization is absolutely necessary, as this will provide certainty to the operators to plan and execute the implementation. We suggest that the Authorization process and its issuance should be completed within a maximum period of 4 months.

In this regard, TRAI recommendations on ease of doing business for Satcom issued in May 2023 is relevant.

13. Whether there are any other suggestions related to assignment of spectrum for-

- c) NGSO based Fixed Satellite Services for providing data communication and Internet services;
- d) GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

Please provide a detailed response with justifications.

SIA-India:

Currently, the spectrum is assigned on a carrier-by-carrier basis. Any changes in the size of the carrier or increase/decrease in the number of carriers warrants changes to the assignment, which is time consuming. Spectrum should be assigned as a block as opposed to carrier-by-carrier

There should not be any unnecessary provisions or regulations related to the assignment of spectrum that could inevitably translate to higher operating costs for the use of FSS/MSS for providing data communication and internet services.

More importantly, provisions relating to the assignment of spectrum should be rational, consistent and equitable to that of GSO FSS.

14. Should spectrum charges for NGSO-based FSS providing data communication and Internet services, be levied:

- i. On a per MHz basis
- ii. On a percentage of Adjusted Gross Revenue (AGR) basis, or
- iii. Through some other methodology?

Please provide a detailed justification for your answer.

SIA-India:

No doubt that radio spectrum is integral to the economy in terms of the direct delivery of valuable services and broader societal benefits. Now, satellite sector, particularly satellite communications, where large number of new-entrants and start-ups have entered, continues to invest significantly contributing to the economy of the country. Also, the developments in the capacity of satellite broadband networks will help to sustain and continue the growth. Therefore, a viable, predictable and consistent spectrum pricing is necessary to attract significant investments and ensure overall socio-economic growth in the country.

While considering the spectrum options, the primary objective should always be maximising benefits to society and in turn broader economy of the country by promoting efficient use and revenue generation should be a secondary objective.

In determining the appropriate charges and methodology in India, consideration should be given to the impact that the overall regulatory fees will have on the affordability of the service and the public interest objectives. Such as closing the digital divide in places in which incomes may be low and costs of providing services may already be high. High regulatory charges in such a context would be counterproductive to achieving the public interest objectives of the government. Fees and charges, if any, should relate to administrative costs of governments in regulating a service, as any fees will likely raise the cost of providing the service. Charging for spectrum as a function of revenue brings in greater transparency. Any licensee that earns more revenue pays more and vice-versa. This also encourages new players to get access to spectrum without a burden of paying for the spectrum upfront.

Keeping the above factors in mind, SIA-India opines that spectrum charges for NGSO-based FSS providing data communication and Internet service should be levied “on a percentage of Adjusted Gross Revenue (AGR) basis”.

In this context, it may be recalled that TRAI, in its Recommendations in 2005, 2017, 2020, and 2021 issued from time-to-time on different occasions on related matter to make the Spectrum Usage Charge (SUC) as 1% of AGR for the commercial CUG VSAT, irrespective of the data rate.

In any case, there should be no differentiation between spectrum charges for NGSO and GSO FSS providing data communication and internet services.

15. In case it is decided that spectrum charges for NGSO-based FSS providing data communication and Internet services should be levied on a per MHz basis, should these charges be calculated based on:

- i. The Department of Telecommunications (DoT) order dated December 11, 2023, or

- ii. An alternative approach (please specify)?

Please provide a detailed justification to support your answer.

SIA-India:

To illustrate, the formula towards royalty applied to a 4 GHz spectrum will lead to 280 million Indian Rupees worth of fees. It is clear that the current formula Royalty, R (in Rs.) = 35000 x Bs would lead to astronomical amounts in the case of bandwidth in the order of GHz. This fee is not sustainable for any satellite operator and this fee will be worse off for satellite operators operating in higher order frequency bands where the bandwidth is much larger.

Since this will stifle the investment and growth of satcom services, SIA-India do not support this pricing formula based on a per MHz basis in view of our comments to Q14 above.

This would be in consonance with the National priorities of Mainstreaming Satcom and that of Ease of Doing Business as enshrined in the core principles of the Telecommunications Act 2023

16. If it is decided that spectrum charges for NGSO-based FSS providing data communication and Internet services should be levied on a percentage of AGR basis:

- i. What should be the appropriate percentage of AGR?
- ii. Should a minimum spectrum charge be specified to address the issue of inefficient utilization of spectrum? If yes, what methodology may be used to determine the amount of the minimum spectrum charge?
- iii. Is there an alternative approach that could be followed to address the issue of inefficient spectrum utilization?

Please provide a detailed justification for your answers.

SIA-India:

Our comments to Q-14 refers. It should be 1% of AGR as per conscious and consistent stand of TRAI in previous occasions on the issue.

It is in the interest of satellite operators to use spectrum efficiently to maximise the capability of the provision of satellite services. Hence, there is no need for any

unnecessary charges to be specified to address the concern on the use of inefficient utilisation of spectrum.

17. Considering the Adjusted Gross Revenue (AGR) based charging methodology currently followed for Commercial VSAT and in view of the enhanced scope of the Satellite service authorisation, what should be the spectrum charge, as a percentage of AGR, that should be levied on GSO-based FSS? Or,

Should some alternative spectrum charging methodology be used for determining spectrum charges for GSO-based FSS?

Please provide a detailed justification for your answer.

SIA-India:

Our comments to Q-14 refers. It should be 1% of AGR as per conscious and consistent stand of TRAI in previous occasions on the issue.

Charging for spectrum as a function of revenue brings in greater transparency. Any licensee that earns more revenue pays more and vice-versa. This also encourages new players to get access to spectrum without a burden of paying for the spectrum upfront

18. Should spectrum charges for GSO and NGSO-based MSS that provide voice, text, data, and Internet services be levied:

- i. On a per MHz basis,
- ii. On a percentage of AGR basis, or
- iii. Through some other methodology?

Please provide a detailed justification for your answer.

SIA-India:

Consideration should be at par with FSS networks and our comments to Q14 refers.

19. If it is determined that spectrum charges for GSO/NGSO-based MSS providing voice, text, data, and Internet services should be levied on a per MHz basis, should these charges be calculated based on:

- i. The Department of Telecommunications (DoT) order dated December 11, 2023, or
- ii. An alternative approach (please specify)?

Please provide a detailed justification to support your answer.

SIA-India:

We do not support this pricing formula in view of response to Q 18.

20. If it is decided that spectrum charges for GSO/NGSO-based MSS providing voice, text, data, and Internet services should be levied on a percentage of AGR basis:

- i. What should be the appropriate percentage?
- ii. Should a minimum spectrum charge be specified to address the issue of inefficient utilization of spectrum? If yes, what methodology may be used to determine the amount of the minimum spectrum charge?
- iii. Is there an alternative approach that could be followed to address the issue of inefficient spectrum utilization?

Please provide a detailed justification for your answers.

SIA-India:

Our comments to Q-14 and Q-16 refer. It should be 1% of AGR as per conscious and consistent stand of TRAI in previous occasions on the issue.

21. Whether there are any other issues/suggestions relevant to the spectrum charging for:

- i. NGSO/GSO based FSS providing data communication and Internet services.
- ii. NGSO/GSO based MSS providing voice, text, data, and Internet services.

The response may be submitted with proper explanation and justification.

SIA-India:

Spectrum costs should be reasonable and aimed primarily at covering the administrative costs associated with managing, monitoring, and regulating satellite spectrum. This approach encourages more efficient and equitable spectrum use, fostering innovation and ensuring the sustainability of the satellite industry.

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