



Consultation Paper on Assignment of Spectrum for Space-based Communication Services
IAFI counter comments to the comments by the proponents of the auctions

Reference on TRAI's Consultation paper dated on 06/04/2023

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Chapter 1

Introduction ITU-APT Foundation of India (IAFI)

We, the ITU-APT Foundation of India (IAFI), are a registered non-profit and non-political industry association registered under the Cooperative Societies Act of India. IAFI has been recognized by the International Telecommunication Union (ITU), the UN Organization for ICT issues, as an international/ regional Telecommunications organization and has been granted the sector Membership of the ITU Radio Communications Bureau (ITU-R), ITU Development Bureau (ITU-D) and ITU Telecommunication Standardization Bureau (ITU-T). IAFI is also an affiliate member of the APT. IAFI has been working for the last 20 years to encourage the involvement of professionals, corporate, public/private sector industries, R&D organizations, academic institutions, and other agencies in the activities of the ITU and APT. For more details regarding IAFI, please visit <https://www.itu-apt.org/>

Chapter 2

IAFI counter comments to the comments by the proponents of the auctions

IAFI notes that out of 64 comments received by TRAI on the Consultation Paper released regarding assignment of spectrum for space-based services, 47 submissions are in favour of the Administrative Assignment of Satellite Spectrum (see the summary in Annex 1). There are only 14 submissions that support auctioning spectrum for satellite services, as there is a general lack of understanding of how satellite operators effectively share the spectrum in the same geographical locations and coordinate among each other.

The key differences between satellite services and terrestrial cellular mobile services relates to how the satellite operators can effectively share spectrum in the same geographical locations and coordinate among each other. In our view, satellite coordination can be left to the operators.

Satellite operators have been coexisting for decades all over the world and many new satellite operators are currently carrying out coordination to operate in the same frequency ranges. Specifically, coexistence between satellite networks is based on either a sufficient angular separation on the GSO arc or on coordination.

Furthermore, there is absolutely no evidence that distances may be required between NGSO gateways in order for them to coexist. Overall, coexistence depends on various factors, including the agreed interference criterion and the technical characteristics of the NGSO systems involved. As such, it is better left to the satellite operators as part of the overall system coordination coexistence between NGSO systems and GSO networks, which is ensured either via compliance with Article 22 of ITU Radio Regulations limits or coordination, depending on the frequency bands.

Coexistence between NGSO systems is established by bi-lateral coordination discussions in which analysis are carried out by the different operators, taking into account the relevant provisions of the ITU Regulations. Furthermore, designated exclusion zone for satellite gateways would make sense only in frequency bands where terrestrial mobile services are being deployed on a co-primary basis. Also, even in that case, there would be no need for exclusive spectrum allocation, as multiple satellite operators can deploy gateways in the same location.

The capability to share and the coordination that satellite operator's carryout allows for efficient spectrum utilization, while terrestrial mobile network can coexist only thanks to splitting the spectrum and having it allocated on an exclusive basis.

Also, the assumption that terrestrial mobile services and satellite services are the same is incorrect, especially in the case of satellite services using microwave frequencies (C, Ku, Ka). The purported analogy between terrestrial access spectrum and the satellite one is unfounded, as the two services, while both providing connectivity, are intrinsically different in the physics of the link (i.e. sharing feasibility) and in the economic and societal aspects.

Cellular mobile is reaching billions of customers with corresponding revenues. Satellite service provision is, in comparison, niche, but indispensable, filling in the gaps in terrestrial service provision to guarantee safety, connectivity and equal opportunity. There are no small hand held satellite devices operating in microwave bands and there are orders of magnitude of difference in terms of the number of customers and revenue. As such, the idea of equating services and suggesting a fair competition on spectrum pricing is nonsensical. Satellite operators will not be able to compete in auctions with mobile operators, as the overall business model is completely different. This would lead to mobile operators winning the satellite spectrum auctions and becoming the exclusive gatekeepers of satellite usable spectrum in the country. Subsequently, the auction winner would be the "spectrum gate keeper" with which satellite operators would have to negotiate a private contract agreement in a non-transparent process, in order to be able to use spectrum that could be shared in the first place. This will lead to a monopolistic or semi-monopolistic situation, hampering competitiveness, limiting the amount of spectrum usable, and therefore the achievable performances, and, ultimately, damaging the users. Furthermore, the aspect of possible "competition" between the two different services needs to be carefully represented. First of all, there is no competition in the air and at sea. Also on land, satellite services will primarily address areas that terrestrial services cannot or do not wish to reach, even for service provision directly to consumers (nobody will buy a satellite terminal if they can have good terrestrial connectivity). In this respect, satellites provide an integral service, rather than a competitive one. Satellite services, on the other hand, can compete with terrestrial services when it comes to backhaul, but, in this case, the competition is with either fiber or microwave point-to-point links, not with mobile/IMT. In this respect, satellite services can actually support mobile service providers with effective and viable backhaul solutions. Finally, it may be worth considering the following question: what would become of satellite services, if every country would start assigning satellite spectrum with an auction mechanism?

In addition, IAFI also wishes to bring the following key points to the Authority's attention:

1. The argument that satellite spectrum sharing is unachievable and that band segmentation is the only interference solution disregards the established practices within the satellite industry. Both GSO and NGSO operators have demonstrated that efficient spectrum sharing is possible. Thus, the notion that band segmentation is the only solution is non-sense, since the industry's track record shows that sharing spectrum is not only achievable but also the most efficient way to utilize this scarce resource.
2. The "same service same rule" assertion fails when comparing mobile cellular and satellite services due to their unique operational characteristics and spectrum usage. Mobile services target densely populated areas and require exclusive spectrum use to avoid interference, leading to high spectrum costs. On the other hand, satellite services provide critical connectivity to rural and underserved areas, operating on a non-exclusive basis, which allows for spectrum sharing among operators. Hence, a "right rule for the right service" approach should be adopted to ensure a balanced

spectrum allocation that takes into account each service's distinct needs and societal value.

3. The critique against the 'first-come-first-served' (FCFS) basis of administrative allocation, invoking the Supreme Court's stance, overlooks the unique nature of satellite spectrum. As pointed out by several other submissions, while the Supreme Court's critiqued FCFS in certain scenarios, judgment has also recognized that auction is not the only method for spectrum allocation. Unlike terrestrial services, satellite spectrum supports efficient sharing among multiple operators, without causing interference. Therefore, administrative allocation for satellite spectrum, a resource fundamentally shared rather than exclusive, remains an effective approach that fosters competition, innovation, and public welfare.
4. The case of Thailand auction is a misunderstanding of these distinct aspects of satellite communication. Orbital slots represent specific geostationary positions for satellites, based on filings submitted to the ITU by individual countries. On the other hand, spectrum refers to the radio frequencies that satellites use to transmit and receive signals. While the two are interconnected, they have different functions and are regulated differently. Additionally, auctioning a domestic orbital slot does not grant exclusive rights to a particular spectrum. Spectrum can still be shared among various satellite operators with satellites in different orbital slots, as seen in Fixed Satellite Services (FSS). In sum, conflating the auctioning of orbital slots with the auctioning of spectrum indicates a lack of understanding of the distinct roles and complexities of managing these separate resources in satellite operations.
5. The Saudi Arabian example of MSS spectrum auctioning cannot serve as a universal model, given the broader international trend against such auctions for satellite services, the key differences between MSS and FSS should not be overlooked. MSS, designed for mobile platforms /handheld devices using omnidirectional antennas, often requires exclusive spectrum to avoid interference, while FSS in microwave bands enables spectrum sharing between multiple operators due to highly directional antennas and coordination mechanisms. Furthermore, the MSS blocks were sold with a path to convert their usage to terrestrial. Therefore, it is arguable whether the Saudi Arabia auction of S band spectrum was targeted for space-based communications, instead, replicating a terrestrial assignment in another much more comprehensive consultation, CITC made it very clear that satellite bands were out of the discussion for auction and are protected. "Continued guaranteed and protected access to all existing satellite bands for current and future uses, which include L, C, Ku and Ka bands..."

It is reiterated that that the countries' broadband penetration in rural area could not reach to even 30% till date, as TSPs/ISPs are investing only in the urban areas considering the poor chances of return on investment, in extending terrestrial network to rural area. Even Govt. of India investments in Bharat-Net project could not succeed in bring up the rural broadband penetration. On the other hand, satellite communication can tackle the territorial barriers in rural area due to their vast coverage, the advent of millimeter-wave

technology and the much-needed privatization of the space industry in reducing cost. Satellite communication can contribute in increasing broadband penetration in rural and remote areas by providing wide coverage, quick deployment, scalability, bridging the digital divide, cost-effectiveness, flexibility, and disaster resilience.

To conclude, IAFI wishes to thank TRAI for the opportunity to provide further comments and remains available for additional clarifications.

Annexure-I

Comments of stakeholders on the TRAI consultation paper regarding assignment of Spectrum for the Space-based Communication Services

A. Summary of the comments:

S. No.	Suggested Method	Number of stake holders
1.	Administrative	47
2.	Auction	14
3.	No comments	3
Total		64

B. Details of the views expressed:

S. No.	Name	Views
1.	GSMA	Auction
2.	BIF	Administrative
3.	IAFI	Administrative
4.	ISPA	Administrative
5.	NGN Forum	Auction
6.	NASSCOM	Administrative
7.	MAIT	Administrative
8.	US-India Business Council	Administrative
9.	AVIA	Administrative
10.	ICEA	Administrative
11.	SIA	Administrative
12.	IBDF	Administrative
13.	NBDA	Administrative
14.	BUZZWORD	Auction
15.	PHDCCI	Auction
16.	GSOA	Administrative
17.	INTELSAT	Administrative
18.	THAICOM	Administrative
19.	INMARSAT	Administrative
20.	KOAN	Administrative
21.	ASIASAT	Administrative
22.	The Dialogue	Administrative
23.	Asianet Digital Pvt Network	Auction
24.	VIASAT	Administrative
25.	Myriota	-----
26.	DHRUVA	Administrative

27.	GLOBESTAR	Administrative
28.	STARLINK	Administrative
29.	TELESAT	Administrative
30.	CIVIS	Auction
31.	ESYA	Administrative
32.	ABS Global	Administrative
33.	AMAZON	Administrative
34.	KAWA SPACE	Administrative
35.	Kalinga Research and Mgmt	Auction
36.	L&T	Administrative
37.	MANGATA	Administrative
38.	Red Books	Administrative
39.	Sateliot	Administrative
40.	VIHAAN	Administrative
41.	DORS	Auction
42.	ICT Robot	Auction
43.	Augsenselab Pvt Ltd	Administrative
44.	Suhora Technologies	Administrative
45.	Xovian Aerospace Pvt. Ltd	Administrative
46.	Manastu Space	Administrative
47.	Rajiv Khattar	Administrative
48.	Akash Bahure	-----
49.	R. Ashok	Auction
50.	Harinath	-----
51.	TCL	Administrative
52.	Bharti AirTel	Administrative
53.	Hathway	Auction
54.	DEN	Auction
55.	Times Network	Administrative
56.	Dish TV India Ltd	Administrative
57.	R Jio	Auction
58.	PMSL	Administrative
59.	HUGHES	Administrative
60.	Vodafone	Auction
61.	OneWeb	Administrative
62.	NXT Digital Ltd	Administrative
63.	Nelco Ltd	Administrative
64.	TATA Play	Administrative
