

To
Shri Akhilesh Kumar Trivedi,
Advisor (Networks, Spectrum and Licensing),
Telecom Regulatory Authority of India

Dear Sir,

Sub: Comments on Consultation Paper on Assignment of Spectrum for Space-based Communication Services

At the outset of this letter, we would like to express our sincere appreciation for taking the initiative to bring policy reforms in the telecom sector for supporting the new and emerging technologies and solutions. In response to the same, we are keen to provide our inputs and humble contribution to this policy formulation process.

It is with this background, that we humbly share with you our preliminary comments on the questions on method of assignment of spectrum for space-based communication services. As one of the emerging space-tech enterprises in India, we look forward to the ease, equitable and fair opportunity of market access and regulatory clarity, as we remain committed to build a sustainable New Space enterprise to contribute towards the strategic and universal telecommunication support of India.

We sincerely believe that our comments will contribute to building a dynamic and healthy ecosystem for Space Technology and Telecom business in India.

Thanks and Regards,



Sanjay Nekkanti
Director & Chief Executive Officer
Dhruva Space Private Limited

1. Question 1

For space-based communication services, what are the appropriate frequency bands for (a) gateway links and (b) user links, that should be considered under this consultation process for different types of licensed telecommunications and broadcasting services? Kindly justify your response with relevant details.

Response

- a. The space ecosystem has seen emergence of diverse players in the past few years, with many more to emerge in the coming years, under the aegis of the recently announced Indian Space Policy.
- b. It is envisaged that these emerging spacetechnology enterprises will enable a range of diverse space communication applications and that regulatory clarity is of utmost importance in this regard.
- c. Accordingly the quantum of spectrum, frequency bands and network architecture will be dynamic in nature as a result of this continuous innovation.
- d. A holistic approach should be employed in determining the appropriate method for assignment of spectrum, to ensure Ease of Doing Business and Regulatory Clarity for these emerging space technology enterprises.
- e. Therefore, all bands identified under the Radio Regulations of ITU which may be used for licensed telecommunication activities should be considered under this consultation process.

2. Question 2

What quantum of spectrum for (a) gateway links and (b) user links in the appropriate frequency bands is required to meet the demand of space-based communication services? Information on present demand and likely demand after about five years may kindly be provided in two separate tables as per the proforma given below:

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

3. Question 3

Whether there is any practical limit on the number of Non-Geo Stationary Orbit (NGSO) satellite systems in Low Earth Orbit (LEO) and Medium Earth Orbit (MEO), which can work in a coordinated manner on an equitable basis using the same frequency range? Kindly justify your response.

Response

There is no practical limit on the number of NGSO satellite systems in LEO which can work in a coordinated manner on an equitable basis using the same frequency range. Except certain instances wherein different satellite networks/systems have an identical footprint at the same time in the same spot with respect to Earth or in cases of ISL. Article 9 of the Radio Regulations provide adequate measures for coordinating use of NGSO satellite systems in the same frequency bands. There are ongoing studies in this respect at ITU, more specifically studies in relation to the scaling factor for NGSO satellite networks.

4. Question 4

For space-based communication services, whether frequency spectrum in higher bands such as C band, Ku band and Ka band, should be assigned to licensees on an exclusive basis? Kindly justify your response. Do you foresee any challenges due to exclusive assignment? If yes, in what manner can the challenges be overcome? Kindly elaborate the challenges and the ways to overcome them.

Response

- a. None of the frequency spectrum bands for space-based communication services through NGSO should be assigned to licensees on an exclusive basis. There is adequately established precedence that multiple satellite systems can co-exist in the same frequency band in a coordinated manner, as per the Radio Regulations. Therefore, it should not be in the interest of any satellite operator or end user to require access to exclusively assigned spectrum.

- b. The principle governing spectrum management is fair and equitable use of spectrum by all, which is fundamentally opposed to the idea of giving “exclusive” rights of spectrum to any single or group of operators.
- c. The division of spectrum in chunks leads to inefficiency and inflexibility which is detrimental to all stakeholders in the ecosystem - satellite manufacturers, operators, end user terminal manufacturers and consumers as well. It creates artificial hurdles in sharing spectrum and establishing interoperability.
- d. It promotes a monopolistic or at best a cartel based approach by service providers as they have exclusive rights to a certain spectrum band, where other emerging or existing competitive solutions may not have adequate regulatory capacity to offer services, even if they have coordinated orbital spectrum resources as per ITU practices, which India is a signatory too as well.

5. Question 5

In case it is decided to assign spectrum in higher frequency bands such as C band, Ku band and Ka band for space-based communication services to licensees on an exclusive basis,

- a. What should be the block size, minimum number of blocks for bidding and spectrum cap per bidder? Response may be provided separately for each spectrum band.
- b. Whether intra-band sharing of frequency spectrum with other satellite communication service providers holding spectrum up to the prescribed spectrum cap, needs to be mandated?
- c. Whether a framework for mandatory spectrum sharing needs to be prescribed? If yes, kindly suggest a broad framework and the elements to be included in the guidelines.
- d. Any other suggestions to ensure that the satellite communication ecosystem is not adversely impacted due to exclusive spectrum assignment, may kindly be made with detailed justification. Kindly justify your response.

Response

With reference to the response in earlier questions, it is reiterated that spectrum should not be assigned on an exclusive basis for any space-based communication services to licensees on an exclusive basis in any frequency band.

A framework for sharing spectrum should be prescribed in line with the principles and methods prescribed in the Radio Regulations. It ensures consistency of regulation and ease of operation in India, thereby promoting access to more competitive solutions from across the globe. Further, spectrum being a national resource should only be allowed to be used in such a way that it is in the interest of the citizens, consumers and the nation itself. Therefore, avoiding duality of standards and promoting ease of access will enhance the quality of coverage/service and drive down cost of access to services for end customers as well.

- a. **Satellite Spectrum is categorized to be “Club Goods”** : Satellite spectrum is a shared resource and so, fundamentally, it cannot be auctioned as it cannot be exclusively allocated as mentioned in the consultation paper in discussion. Reference is made to the characteristics of satellite spectrum being “club goods” as per the “Economic Theory of Clubs” by James Buchanan (1965).
- b. **Duality of standards and practices in addition to ITU** : Satellite spectrum has no national territorial limits and is international in character. It is coordinated and managed by the International Telecommunications Union (ITU) through a global convention which is signed by 194 nations, to which India is also a signatory. Consequently, satellite spectrum management is subject to the radio regulation of the ITU. Promoting duality of standards for access to Indian markets is an unnecessary hurdle which will stifle introduction of competitive and innovative solutions for the mass consumers.
- c. **Global Practices & Lessons** : It is to be noted that no jurisdiction has been able to successfully carry out auction of satellite spectrum or assignment of satellite spectrum on an exclusive basis. The hurdles have been found to be against the interest of economic and equitable use of spectrum and also against consumer interest. Reference is made to the attempts of auctioning orbital spectrum resources by the US, Brazil, Mexico.

- d. Satellite and Terrestrial Spectrum Use and Networks have no fundamental similarity** - Hence modeling methods or assumptions pertaining to usage of spectrum for space-based services in line with practices for terrestrial spectrum assignment is not prudent and may be a false dichotomy.
 - e. Exclusive Assignment is not really exclusive** - The fallacy of assignment of spectrum on exclusive basis is that an appropriate method for ensuring sharing of spectrum with other enterprises has to be created and enforced in line with the basic tenets of spectrum management under our International Obligations and current international practices. This may not be feasible even with the intervention of the regulator as a duality of standards would be established, making it potentially more difficult to abide by the principles of equity and efficient use of spectrum.
 - f. Artificial Gatekeepers of Market** - Assignment of spectrum on exclusive basis will make way for creation of artificial gatekeepers of the market with respect to satellite-based services.
 - g. Economic Capacity and Market Development** - The telecom service providers using terrestrial spectrum can afford auction models economically as the revenue generation and existing user base is very large. The current annual revenue of Indian mobile operators is about Rs.2.5 lakh crores whereas that of the Indian satellite VSAT operators is only around Rs. 500/- crores. Satellite services are therefore as miniscule as 1/500 th or a mere 0.2% of the mobile operators' revenue. It would yet again be treating unequals on the same footing, which is a violation of the fundamental right to equitable treatment.
 - h. Stifling growth of Satcom Market and discarding economic benefits of satellite based services in bringing down cost of access to data** - In furtherance to the previous point, it is to be noted that there is very little adoption and market penetration for satellite based services. Adversely increasing hurdles in providing satellite based services will only lead to market stagnation and will negatively impact the ability of the space based communication systems to contribute to reduction in cost of access to data for the end consumer. To provide further context, since the cost and difficulty of market access will increase, a handful of enterprises with adequate risk appetite and investment potential will be able to offer services, where the cost of being able to do so will ultimately be passed on to the end customer. This is in clear contradiction to the goal of the Government of India to bring down the cost of access to data and promote digital inclusion.
 - i. Supreme Court's clarification on Spectrum Auctions: India.** The Supreme Court has stated that "Auction may be the best way of maximising revenue, but revenue maximisation may not always be the best way to serve public good." Hence keeping into account the public interest and public good, the focus on cost of access to data, diversity of choice, digital inclusion and satcom industry development should be the key consideration factors in determining the method for assignment of spectrum. In lieu of the aforesaid reasons and keeping in mind this statement by the Supreme Court, it is clear that the administrative method of spectrum assignment on non-exclusive basis should be continued.
 - j. Investment Risk & Uncertainty for emerging Space Tech Enterprises:** Any enterprise wanting to plan and establish a constellation of satellites for providing satellite-based services in India cannot predict the cost of advancing these services in India, unless there is prior participation and assignment of spectrum in an auctioning process. Hence, building and launching of satellites can only be done after an auctioning process, where the outcome of the auction may make it unfavorable for the enterprise establishing Indian space assets to invest in a constellation for providing services at all, given the economics of spectrum and NGSO space assets. With this uncertainty, no investment can be sought for establishing space assets to provide broadband services due to the increased risk and uncertainty. The fledgling space sector which is in nascent stages will suffer severe disadvantages of the implications arising from the introduction of spectrum auction.
- 6. Question 6**
What provisions should be made applicable on any new entrant or any entity who could not acquire spectrum in the auction process/assignment cycle?

- a. Whether such an entity should take part in the next auction/assignment cycle after expiry of the validity period of the assigned spectrum? If yes, what should be the validity period of the auctioned/assigned spectrum?
- b. Whether spectrum acquired through auction be permitted to be shared with any entity which does not hold spectrum/ or has not been successful in auction in the said band? If yes, what measures should be taken to ensure rationale of spectrum auction and to avoid adverse impact on the dynamics of the spectrum auction?
- c. In case an auction based on exclusive assignment is held in a spectrum band, whether the same spectrum may again be put to auction after certain number of years to any new entrant including the entities which could not acquire spectrum in the previous auction? If yes,
 - i. After how many years the same spectrum band should be put to auction for the potential bidders?
 - ii. What should be the validity of spectrum for the first conducted auction in a band? Whether the validity period for the subsequent auctions in that band should be co-terminus with the validity period of the first held auction?
Kindly justify your response.

Response

As stated in previous questions, satellite spectrum should not be auctioned or assigned exclusively as it is a shared resource.

7. Question 7

Whether any entity which acquired the satellite spectrum through auction/ assignment should be permitted to trade and/or lease their partial or entire satellite spectrum holding to other eligible service licensees, including the licensees which do not hold any spectrum in the concerned spectrum band? If yes, what measures should be taken to ensure rationale of spectrum auction and to avoid adverse impact on the dynamics of the spectrum auction? Kindly justify your response.

Response

As stated in previous questions, satellite spectrum should not be auctioned or assigned exclusively as it is a shared resource. Hence, trading and leasing of spectrum should not have to be a primary option for any satellite operator using similar spectrum as another, including existing licensees. Standards at par with the spectrum coordination and spectrum sharing guidelines prescribed by ITU should be mandated in India to enable equitable access and fair use of spectrum.

8. Question 8

For the existing service licensees providing space-based communication services, whether there is a need to create enabling provisions for assignment of the currently held spectrum frequency range by them, such that if the service licensee is successful in acquiring required quantum of spectrum through auction/assignment cycle in the relevant band, its services are not disrupted? If yes, what mechanism should be prescribed? Kindly justify your response.

Response

As stated in previous questions, satellite spectrum should not be auctioned or assigned exclusively as it is a shared resource. Hence, trading and leasing of spectrum should not have to be a primary option for any satellite operator using similar spectrum as another, including existing licensees. Standards at par with the spectrum coordination and spectrum sharing guidelines prescribed by ITU should be mandated in India to enable equitable access and fair use of spectrum.

9. Question 9

In case you are of the opinion that the frequency spectrum in higher frequency bands such as C band, Ku band and Ka band for space- based communication services should be assigned on shared (non- exclusive) basis, -

- a. Whether a broad framework for sharing of frequency spectrum among satellite communication service providers needs to be prescribed or it should be left to mutual coordination? In case you are of the opinion that broad framework should be prescribed, kindly suggest the framework and elements to be included in such a framework.
- b. Any other suggestions may kindly be made with detailed justification. Kindly justify your response.

Response

As stated in previous questions, satellite spectrum should not be auctioned or assigned exclusively as it is a shared resource. Hence, trading and leasing of spectrum should not have to be a primary option for any satellite operator using similar spectrum as another, including existing licensees. Standards at par with the spectrum coordination and spectrum sharing guidelines prescribed by ITU should be mandated in India to enable equitable access and fair use of spectrum.

The sharing of spectrum among various satellite operators/service providers is governed by Article 9 of the ITU Radio Regulations (RR). The RR provide detailed guidelines on the sharing and coordination of spectrum. We consider the terms for sharing of spectrum among satellite communication operators should be left to frequency coordination, and it should be required for the parties engaged in the coordination to notify the Indian Administration before they can be licensed to operate in the country.

10. Question 10

In the frequency range 27.5-28.5 GHz, whether the spectrum assignee should be permitted to utilize the frequency spectrum for IMT services as well as space-based communication services, in a flexible manner? Do you foresee any challenges arising out of such flexible use? If yes, in what manner can the challenges be overcome? Kindly elaborate the challenges and the ways to overcome them.

Response

The frequency range 27.5 to 28.5 GHz has existing High Throughput Satellite Systems operating across the globe. ISRO also has planned satellite systems in this frequency band. A number of planned NGSO constellations are also in this frequency band, as it has inherent advantages and optimal technical utility in providing high speed, low latency and cost effective services. Further, this proposed change in frequency allocation is inconsistent with the Region 3 Plan, with no such proposal in discussion or consideration at ITU as well. Further, addition of coordinated use with IMT systems will unnecessarily limit the potential of this frequency band where a sizeable investment and offerings exist across the globe.

11. Question 11

In case it is decided to permit flexible use in the frequency range of 27.5 - 28.5 GHz for space-based communication services and IMT services, what should be the associated terms and conditions including eligibility conditions for such assignment of spectrum? Kindly justify your response.

Response

With reference to response to Question 10, we are of the view that flexible use in frequency range of 27.5 - 28.5 GHz for space-based communication services and IMT services should not be permitted.

12. Question 12

Whether there is a requirement for permitting flexible use between CNPN and space-based communication services in the frequency range 28.5-29.5 GHz? Kindly justify your response.

Response

With reference to response to Question 10, we are of the view that frequency range in Ka Band is crucial for emerging satellite networks providing high throughput services, hence flexible use will limit the potential benefits of the satellite based solutions.

13. Question 13

Do you foresee any challenges in case the spectrum assignee is permitted to utilize the frequency spectrum in the range 28.5-29.5 GHz for cellular based CNPN as well as space-based communication services, in a flexible manner? What could be the measures to mitigate such challenges? Suggestions may kindly be made with justification.

Response

With reference to response to Question 10, we are of the view that frequency range in Ka Band is crucial for emerging satellite networks providing high throughput services, hence flexible use will limit the potential benefits of the satellite based solutions.

14. Question 14

Whether space-based communication services should be categorized into different classes of services requiring different treatment for spectrum assignment? If yes, what should be the classification of services and which type of services should fall under each class of service? Kindly justify your response.

Response

There is no requirement to distinguish space based communication services into different classes for the purpose of spectrum assignment, as with the emerging space technology ecosystem many other class of services will be enabled by space assets in the future which should also enjoy similar regulatory clarity and support by the regulators in light of the larger consumer and national interests.

15. Question 15

What should be the methodology for assignment of spectrum for user links for space-based communication services in L-band and S-band?

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

16. Question 16

What should be the methodology for assignment of spectrum for user links for space-based communication services in higher spectrum bands like C-band, Ku-band and Ka-band.

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

17. Question 17

Whether spectrum for user links should be assigned at the national level, or telecom circle/ metro-wise? Kindly justify your response.

Response

The footprint of a satellite beam is usually wider than a typically identified service area in terrestrial networks context. In light of the diverse nature of spectrum characteristics of each satellite system, it is not prudent to divide assignment into further geographical areas within India. It will be yet another false dichotomy of comparing spectrum assignment models with terrestrial spectrum assignment. This will also be a departure of globally accepted practices, which impacts not only commercial returns but also fundamental principles of product development for satellites.

18. Question 18

In case it is decided to auction user link frequency spectrum for different types of services, should separate auctions be conducted for each type of services? Kindly justify your response with detailed methodology.

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

19. Question 19

What should be the methodology for assignment of spectrum for gateway links for space-based communication services?

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

20. Question 20

In case it is decided to auction gateway link frequency spectrum for different types of services, should separate auctions be conducted for each type of services? Kindly justify your response with detailed methodology.

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

21. Question 21

In case it is decided to assign frequency spectrum for space-based communication services through auction,

- (a) What should be the validity period of the auctioned spectrum?
- (b) What should be the periodicity of the auction for any unsold/available spectrum?
- (c) Whether some mechanism needs to be put in place to permit the service licensee to shift to another satellite system and to change the frequency spectrum within a frequency band (such as Ka- band, Ku-band, etc.) or across frequency bands for the remaining validity period of the spectrum held by it? If yes, what process should be adopted and whether some fee should be charged for this purpose?

Kindly justify your response.

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

22. Question 22

Considering that (a) space-based communication services require spectrum in both user link as well as gateway link, (b) use of frequency spectrum for different types of links may be different for different satellite systems, and (c) requirement of frequency spectrum may also vary depending on the services being envisaged to be provided, which of the following would be appropriate: (i) to assign spectrum for gateway links and user links separately to give flexibility to the stakeholders? In case your response is in the affirmative, what mechanism should be adopted such that the successful bidder gets spectrum for user links

as well as gateway links.

Or (ii) to assign spectrum for gateway links and user links in a bundled manner, such that the successful bidder gets spectrum for user link as well as gateway link? In case your response is in the affirmative, kindly suggest appropriate assignment methodology, including auction so that the successful bidder gets spectrum for user links as well as gateway links.

Response

All assignment of spectrum in any frequency band for any service for space-based communication should be made on non-exclusive shared basis in line with the coordination methods prescribed in the Radio Regulations of ITU. Hence, the point of bidding/auction is not applicable.

23. Question 23

Whether any protection distance would be required around the satellite earth station gateway to avoid interference from other satellite earth station gateways for GSO/ NGSO satellites using the same frequency band? If yes, what would be the protection distance (radius) for the protection zone for GSO/ NGSO satellites?

Response

Yes, adequate efd limits should be notified in this regard, and adequate methods for coordination are available as reference in the Radio Regulations.

24. Question 24

What should be the eligibility conditions for assignment of spectrum for each type of space-based communication service (as mentioned in the Table 1.3 of this Consultation Paper)?

Response

Dhruva Space presents no view on this currently. It is suggested that eligibility conditions be derived keeping into account the realities of the space technology ecosystem from an emerging enterprises perspective as well and that assignment should only be made on an administrative non-exclusive basis.

25. Question 25

What should be the terms and conditions for assignment of frequency spectrum for both user links as well as gateway links for each type of space-based communication service? Among other things, please provide your detailed inputs with respect to roll-out obligations on space-based communication service providers. Kindly provide a response for both scenarios viz. exclusive assignment and non-exclusive (shared) assignment with justification.

Response

Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

It may be noted that certain emerging enterprises may require a longer period to build and establish space assets after having clarity on assignment of spectrum. Hence, roll-out obligations should be such that within 3 years of spectrum assignment if services are not rolled-out, the spectrum should revert back to DoT.

26. Question 26

Whether the provisions contained in the Chapter-VII (Spectrum Allotment and Use) of Unified License relating to restriction on cross holding of equity should also be made applicable for satellite-based service licensees? If yes, whether these provisions should be made applicable for each type of service separately? Kindly justify your response.

Response

Dhruva Space presents no view on this.

27. Question 27

Keeping in view the provisions of ITU's Radio Regulations on coexistence of terrestrial services and space-based communication services for sharing of same frequency range, do you foresee any challenges in ensuring interference-free operation of space-based communication network and terrestrial networks (i.e., microwave access (MWA) and microwave backbone (MWB) point to point links) using the same frequency range in the same geographical area? What could be the measures to mitigate such challenges? Suggestions may kindly be made with justification.

Response

Coordination between different networks and operators cannot be generalized and not all systems may be capable of achieving coordination between each other. It is important to consider each frequency band separately for the purpose of answering this question as the technical and commercial advantages for terrestrial and space based networks are different in each band. However, as mentioned in response to earlier questions, duality of standards in departure to ITU Radio Regulations should not be promoted in this regard.

28. Question 28

In what manner should the practice of assignment of a frequency range in two polarizations should be taken into account in the present exercise for assignment and valuation of spectrum? Kindly justify your response.

Response

Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

29. Question 29

What could be the likely issues that may arise, if the following auction design models are implemented for assignment of spectrum for user links in higher bands (such as C band, Ku band and Ka band)?

- a. **Model #1:** Exclusive spectrum assignment
- b. **Model#2:** Auction design model based on non-exclusive spectrum assignment to only a limited number of bidders

Response

Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

Both Model 1 and Model 2 creates artificial gatekeepers and creates chunks of spectrum which leads to unfair competition, inequitable and inefficient use of spectrum in contradiction to basic tenets of spectrum management. Further, it will lead to investment uncertainty, inequitable treatment and enhanced difficulty of commercialization and market access.

30. Question 30

In your opinion, which of the two models mentioned in Question 29 above, should be used? Kindly justify your response.

Response

Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods

prescribed in the Radio Regulations of ITU.

Both Model 1 and Model 2 creates artificial gatekeepers and creates chunks of spectrum which leads to unfair competition, inequitable and inefficient use of spectrum in contradiction to basic tenets of spectrum management. Further, it will lead to investment uncertainty, inequitable treatment and enhanced difficulty of commercialization and market access.

31. Question 31

In case it is decided to assign spectrum for user links using model # 2 i.e., non-exclusive spectrum assignment to limited bidders ($n + \Delta$), then what should be

- (a) the value of Δ , in case it is decided to conduct a combined auction for all services
- (b) the values of Δ , in case it is decided to conduct separate auction for each type of service

Please provide detailed justification.

Response

We present no view in this regard.

32. Question 32

Kindly suggest any other auction design model(s) for user links including the terms and conditions? Kindly provide a detailed response with justification as to how it will satisfy the requirement of fair auction i.e., market discovery of price.

Response

We do not support auction based assignment of spectrum. Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

33. Question 33

What could be the likely issues, that may arise, if Option # 1: (Area specific assignment of gateway spectrum on administrative basis) is implemented for assignment of spectrum for gateway links? What changes could be made in the proposed option to mitigate any possible issues?

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

34. Question 34

What could be the likely issues, that may arise, if Option # 2: Assignment of gateway spectrum through auction for identified areas/ regions/ districts is implemented for assignment of spectrum for gateway links? What changes could be made in the proposed option to mitigate any possible issues? In what manner, areas/regions/ districts should be identified?

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

35. Question 35

In your view, which spectrum assignment option for gateway links should be implemented? Kindly justify your response.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

36. Question 36

Kindly suggest any other auction design model(s) for gateway links including the terms and conditions? Kindly provide a detailed response with justification as to how it will satisfy the requirement of fair auction i.e., market discovery of price?

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

37. Question 37

Any other issues/suggestions relevant to the subject, may be submitted with proper explanation and justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

38. Question 38

In case it is decided for assignment of spectrum on administrative basis, what should be the spectrum charging mechanism for assignment of spectrum for space-based communications services

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

39. Question 39

Should the auction determined prices of spectrum bands for IMT /5G services be used as a basis for valuation of space-based communication spectrum bands.

Response

The telecom service providers using terrestrial spectrum can afford auction models economically as the revenue generation and existing user base is very large. The current annual revenue of Indian mobile operators is about Rs.2.5 lakh crores whereas that of the Indian satellite VSAT operators is only around Rs. 500/- crores. Satellite services are therefore as miniscule as 1/500 th or a mere 0.2% of the mobile operators' revenue. It would yet again be treating unequals on the same footing, which is a violation of the fundamental right to equitable treatment.

In furtherance to the previous point, it is to be noted that there is very little adoption and market penetration for satellite based services. Adversely increasing hurdles in providing satellite based services will only lead to market stagnation and will negatively impact the ability of the space based communication systems to contribute to reduction in cost of access to data for the end consumer. To provide further context, since the cost and difficulty of market access will increase, a handful of enterprises with adequate risk appetite and investment potential will be able to offer services, where the cost of being able to do so will ultimately be passed on to the end customer. This is in clear contradiction to the goal of the Government of India to bring down the cost of access to data and promote digital inclusion.

Therefore, IMT/5G pricing for spectrum cannot be used for space based communication services.

40. Question 40

Whether the value of space-based communication spectrum bands

- i. For user link
- ii. For gateway link

be derived by relating it to the value of other bands by using a spectral efficiency factor? If yes, with which spectrum bands should these bands be related to and what efficiency factor or formula should be used? Please support your response with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

41. Question 41

If the response to the above question is yes, please specify the detailed methodology to be used in this regard?

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

42. Question 42

In case of an auction, should the current method of levying spectrum fees/ charges for satellite spectrum bands on formula basis/ AGR basis as followed by DoT, serve as a basis for the purpose of valuation of satellite spectrum

- i. For user link
- ii. For gateway link

If yes, please specify in detail what methodology may be used in this regard.

Response

We do not support auction based assignment of spectrum. Any assignment of spectrum in any frequency band for any service for space-based communication should be made through administrative allocation and on non-exclusive basis in line with the coordination methods prescribed in the Radio Regulations of ITU.

43. Question 43

Should revenue surplus model be used for the valuation of space-based spectrum bands

- i. For user link
- ii. For gateway link

Please support your answer with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

44. Question 44

Whether international benchmarking by comparing the auction determined prices of countries where auctions have been concluded for space-based communication services, if any, be used for arriving at the value of space-based communication spectrum bands:

- i. For user link
- ii For gateway link

If yes, what methodology should be followed in this regard? Please give country-wise details of auctions including the spectrum band quantity put to auction, quantity bid, reserve price, auction determined price etc. Please support your response with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

45. Question 45

Should the international administrative spectrum charges/fees serve as a basis/ technique for the purpose of valuation in the case of satellite spectrum bands

- i. For user link
- ii. For gateway link

Please give country-wise details of administrative price being charged for each spectrum band. Please specify in detail terms and conditions in this regard.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

46. Question 46

If the answer to the above question is yes, should the administrative spectrum charges/fees be normalized for cross country differences? If yes, please specify in detail the methodology to be used in this regard?

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

47. Question 47

Apart from the approaches highlighted above which other valuation approaches can be adopted for the valuation of space-based communication spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

48. Question 48

Should the valuation arrived for spectrum for user link be used for valuation for spectrum for gateway links as well? Please justify.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

49. Question 49

If the answer to the above is no, what should be the basis for distinction as well as the methodology that may be used for arriving at the valuation of satellite spectrum for gateway links? Please provide detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

50. Question 50

Whether the value arrived at by using any single valuation approach for a particular spectrum band should be taken as the appropriate value of that band? If yes, please suggest which single approach/method should be used. Please support your answer with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

51. Question 51

In case your response to the above question is negative, will it be appropriate to take the average valuation (simple mean) of the valuations obtained through the different approaches attempted for valuation of a particular spectrum band, or some other approach like taking weighted mean, median etc. should be followed? Please support your answer with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

52. Question 52

Should the reserve price for spectrum for user link and gateway link be taken as 70% of the valuation of spectrum for shared as well as for exclusive assignment? If not, then what ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands in case of (i) exclusive (ii) shared assignment and why? Please support your answer with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

53. Question 53

If it is decided to conduct separate auctions for different class of services, should reserve price for the auction of spectrum for each service class be distinct? If yes, on what parameter basis such as revenue, subscriber base etc. this distinction be made? Please support your answer with detailed justification for each class of service.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.

54. Question 52

In case of auction based and/or administrative assignment of spectrum, what should the payment terms and associated conditions for the assignment of spectrum for space-based communication services relating to:

- i. Upfront payment
- ii. Moratorium period
- iii. Total number of installments to recover deferred payments
- iv. Rate of discount in respect of deferred payment and prepayment

Please support your answer with detailed justification.

Response

Dhruva Space presents no view in this regard as a part of the current consultation.