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**भारत संचार निगम लिमिटेड**  
(भारत सरकार का उपक्रम)  
**BHARAT SANCHAR NIGAM LIMITED**  
(A Govt. of India Enterprise)

**To,**

Shri Syed Tausif Abbas,  
Advisor (Networks, Spectrum and Licensing),  
TRAI, New Delhi.

**No.** BSNLCO-RGLN/25/3/2021-REGLN

dated 10-01-2022

**Sub:** BSNL's Comments on TRAI Consultation Paper on Auction of Spectrum in frequency bands identified for IMT/5G"-reg.

In reference to TRAI consultation paper on "Auction of Spectrum in frequency bands identified for IMT/5G", kindly find the comments of BSNL, as below:

**ISSUES FOR CONSULTATION****Issues related to Quantum of Spectrum and Band Plan**

**Q1.** Whether spectrum bands in the frequency range 526-617 MHz, should be put to auction in the forthcoming auction? Kindly justify your response.

**BSNL Comments:**

- 1) TRAI has indicated, the availability of spectrum as below:
  - a) 526-582 MHz in all the LSAs in coordination with Ministry of information & Broadcasting (MIB). The use will be coordinated with minimum keep out distance from MIB transmitters.
  - b) 582-617 MHz in all the LSAs. This band will be available for IMT/5G and rural point to point links.
  - c) 617-698 MHz in all the LSAs except a few areas/locations.
- 2) Proposed spectrum band in the range 526-698 MHz bands no doubt also provide enhanced coverage, carries excellent penetration potential enabling the wireless signal to penetrate windows and walls. However, as per Para 3.36 of TRAI CP has indicated that *these bands are to be put to auction for the first time. Globally also, only a few jurisdictions have concluded spectrum auctions for wireless services in this band. Thus, there is a constraint of both national and international level data for this band.*
- 3) Since the specifications of the band, band range, channel plan is also yet to be decided. Presently, part of the spectrum is being used for Digital Terrestrial Television & partly for strategic government use. Global device ecosystem may also be a challenge for these bands at this stage, hence, it is too early to comment whether the proposed band in case put for auctions will be able to generate the value proposition for TSPs, as since spectrum available in 700 MHz band has remain unsold for the last five years and important natural resource could not be utilized so far. Hence, addition of more quantity of spectrum in lower bands will not serve the purpose for TSPs.
- 4) Spectrum bands in the frequency range 526-617 MHz should not be put to auction

in the forthcoming auction, as these band plans have not been defined so far by ITU (International Telecom Union)/ 3GPP (3rd Generation Partnership Project) and therefore ecosystem for IMT (International Mobile Telecommunication) is not available in these bands.

**Q2.** If your answer to Q1 above is in affirmative, which band plans and duplexing configuration should be adopted in India? Kindly justify your response.

**BSNL Comments:**N/A

**Q3.** In case your answer to Q1 is in negative, what should be the timelines for adoption of these bands for IMT? Suggestions to make these bands ready for adoption for IMT may also be made along with proper justification.

**BSNL Comments:**

Recently the Government has already take a policy decision that regular conduct of Spectrum Auction will be on annual basis. This may be reviewed before the next auction so as the adequate global ecosystem is available for utilization of the spectrum.

**Q4.** Do you agree that 600 MHz spectrum band should be put to auction in the forthcoming auction? If yes, which band plan and duplexing configuration should be adopted in India? Kindly justify your response.

**BSNL Comments:**

- 1) New band plan (3GPP option B1) for 600 MHz band should be put to auction may be this year or after one year. This band plan is based on reversed FDD (Frequency Division Duplexing) configuration that guarantee`s compatibility/ no interference with adjacent spectrum band and will provide 2X40 MHz band plan i.e. 80 MHz of spectrum, uplink frequencies from 663-703MHz and downlink frequencies 612-652MHz should be put to action.
- 2) The regional plan (APT) for the said spectrum should be finalized first so as to get the benefit of harmonization and scale.
- 3) Lower frequency bands provide wider coverage because they can penetrate objects effectively and thus farther, including buildings. Therefore, this band has a potential to enhance terrestrial mobile coverage, particularly in rural and far-flung areas and also the in-building coverage gaps in urban areas. Thus, opening up of this band could be beneficial for the TSPs as well as the consumers.

**Q5.** For 3300-3670 MHz frequency range, which band plan should be adopted in India? Kindly justify your response.

**BSNL Comments:**

3300-3670MHz should be auctioned as a single band and TDD band frequency arrangement should be adopted as in this range TDD configuration band plans have been defined for both LTE and 5G.As per Band plan n78, the frequency available will be 370 MHz, however, in issues of interference etc. have been resolved, the preference should be given to the Band plan n77 that covers the larger range (3300-4200) for allocation to the TSPs.

**Q6.** Do you agree that TDD based configuration should be adopted for 24.25 to 28.5 GHz frequency range? Kindly justify your response

**BSNL Comments:**

Yes.TDD based configuration should be adopted for 24.25 to 28.5 GHz frequency range as higher frequency bands are generally used for enhancing capacity and lowering latency. Various uses cases in 5G such as URRLC will be dependent on throughput and low

latency and moreover 3G PP has also defined this band only for TDD configuration based plans in mm Wave spectrum bands.

**Q7.** In case your response to Q6 is in affirmative, considering that there is an overlap of frequencies in the band plans n257 and n258, how should the band plan(s) along with its frequency range be adopted? Kindly justify your response.

**BSNL Comments:**

There is a visible difference in adoption of band plan by European countries vis-à-vis USA, Japan and Korea. As per the data referred by TRAI, the band plan n257 has more number of devices announced in comparison to the band plan n258, moreover, the band plan n261 will be part of n257, hence, at this stage the band plan n257 appears to be more suitable to India as well, however, there may be considerable development in n258 band plan also long term. Hence, the decision in this regard should be taken keeping in view the suggestions of stakeholders including OEMs.

**Q8.** Whether entire available spectrum referred by DoT in each band should be put to auction in the forthcoming auction? Kindly justify your response.

**BSNL Comments:**

- 1) As the telecom sector is still reeling under financial stress and it will not be viable for the TSPs to bid for auctions in single tranche. A substantial CAPEX is also required for investment in network, therefore, it should be a considered decision whether DoT should put entire spectrum available for auctions or there could be a yearly plan for supply of spectrum in next five years through auctions so as the TSPs can take a considered decision keeping the financial aspects in focus.
- 2) Theoretically, entire available spectrum except the band 526-617 MHz referred by DoT can be put for auction in the forthcoming auction as it would take care of future situation also, where some more spectrum could be made available for IMT. This will play crucial role in enabling the high-speed and ultra-low-latency features required by many 5G applications and India will benefit significantly from mm Wave enabled 5G.

**Issues related to Block Size**

**Q9.** Since upon closure of commercial CDMA services in the country, 800 MHz band is being used for provision of LTE services,

- a. Whether provision for guard band in 800 MHz band needs to be revisited?
- b. Whether there is a need to change the block size for 800 MHz band? If yes, what should be the block size for 800 MHz band and the minimum number of blocks for bidding for existing and new entrants?

(Kindly justify your response)

**BSNL Comments:**

Block size defined earlier for CDMA services has no relevance now, a block size of 200 KHz as prescribed for 900 MHz band can be adopted better utilization of available spectrum for current and future technologies, if it make the spectrum more contiguous.

**Q10.** Do you agree that in the upcoming auction, block sizes and minimum quantity for bidding in 700 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands, be kept same as in the last auction? If not, what should be the band-wise block sizes and minimum quantity for bidding? Kindly justify your response.

**BSNL Comments:**

Yes, in the upcoming auction, block sizes for 700 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands be kept same as proposed in the last auction.

**Q11.** In case it is decided to put to auction spectrum in 526-698 MHz bands, what should be the optimal block size and minimum quantity for bidding? Kindly justify your response.

**BSNL Comments:**

For the upcoming FDD bands, the block size should be invariably kept as 200 KHz so as to ensure the best utilization of the limited natural resource.

**Q12.** What should be optimal block size and minimum quantity for bidding in 3300-3670 MHz band? Kindly justify your response.

**BSNL Comments:**

The optimal block size in 3300-3600 MHz band is 20 MHz to provide flexibility and at the same time to attain greater efficiency. But as per ISRO request if DOT decides to leave 25MHz (3400 MHz to 3425MHz) untouched for NavIC constellation maintenance and if 20MHz block size could not be retained as 15MHz will remain unsold and thus it cannot be put to auction. Thus to ensure that all available spectrum is put to auction, block size for bidding to be kept as 5MHz. While bidding for multiple blocks of 5MHz each, TSPs will be able to use any of the supported channel bandwidth as per 3GPP standards and it will also ensure auction and utilization of entire available spectrum. Considering that this band is likely to be used for 5G, wherein larger chunk of spectrum may be required, in case the bidder is bidding for multiple blocks the allocation of contiguous blocks should be preferred.

**Q13.** What should be optimal block size and minimum quantity for bidding in 24.25-28.5 GHz? Kindly justify your response.

**BSNL Comments:**

100 MHz should be the optimal block size and minimum quantity for bidding in 24.25-28.5 GHz as this spectrum is likely to be used for provision of 5G use cases/ applications requiring high data rates and ultra-low latency with larger chunk of spectrum. As such, contiguous spectrum allocations of block size 100 MHz should be done to a particular TSP to achieve best utilization of the spectrum.

**Issues related to Eligibility Conditions for Participation in Auction**

**Q14.** Whether any change is required to be made in the existing eligibility conditions for participation in Auction as specified in the NIA for the spectrum Auction held in March 2021, for the forthcoming auction? If yes, suggestions may be made in detail with justification.

**BSNL Comments:**

Existing eligibility condition criteria may be continued.

**Q15.** In your opinion, should the suggested/existing eligibility conditions for participation in Auction, be made applicable for the new spectrum bands proposed to be auctioned? If not, what should be the eligibility conditions for participating in Auction? Kindly justify your response.

**BSNL Comments:**

Existing eligibility condition criteria may be continued.

**Issues related to Interference mitigation in TDD bands**

**Q16.** Is there a need to prescribe any measure to mitigate possible interference issues in 3300-3670 MHz and 24.25-28.5 GHz TDD bands or it should be left to the TSPs to manage the interference by mutual coordination and provisioning of guard bands? Kindly provide justification to your response.

**BSNL Comments:**

Yes, there is need to prescribe some measure to mitigate possible interference issues in 3300-3670 MHz and 24.25-28.5 GHz bands such Synchronization operation of TDD networks that will prevent simultaneous uplink and downlink. Leaving it to the disposal of TSPs may unnecessarily create issues in rollout and compliance at later stage.

The guard band should be prescribed by WPC only. The WPC should be the central Authority to monitor the interference and coordination with TSPs/ spectrum users.

**Q17.** In case your response to the above question is in affirmative,

a. whether there is a need to prescribe provisions such as clock synchronization and frame structure to mitigate interference issues, as prescribed for existing TDD bands, for entire frequency holding or adjacent frequencies of different TSPs? If yes, what should be the frame structure? Kindly justify your response.

b. Any other measures to mitigate interference related issues may be made along with detailed justification.

**BSNL Comments:**

a) Yes there is need to prescribe provisions such as clock synchronization and frame structure to mitigate interference issues. Synchronization is one of the techniques to avoid interference without losing spectrum in guard bands. It can be implemented by means of (a) Starting the frame in the same time and (b) Configuring compatible frame structures (length of the frame, and uplink/downlink ratio) so that all transmitter stop before any receiver starts. DoT may prescribe standard frame structure and clock synchronization procedure to be adopted by all the TSPs.

b) In case a TSP acquires spectrum in 3300-3600 MHz band in more than one LSA, same frequency spots should be assigned to it in all other LSAs. Contiguous block of spectrum to be allotted to a TSP in case it is able to win more than one block in 3300-3600 MHz band.

**Issues related to Roll-out Obligations**

**Q18.** Whether the roll-out obligations for 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz as stipulated in the NIA for last auctions held in March 2021 are appropriate? If no, what changes should be made in the roll out obligations for these bands?

**BSNL Comments:**

Roll out obligation for 5G technology should not be prescribed at this stage as there is no clarity with regard to equipment availability and some of the standards are still to be evolved for 5G.

**Q19.** What should be associated roll-out obligations for the allocation of spectrum in 526-698 MHz frequency bands? Should it be focused to enhance rural coverage? Kindly justify your response.

**BSNL Comments:**

As lower frequency bands has potential to enhance terrestrial mobile coverage, particularly in rural and far-flung areas and they can penetrate objects effectively and thus travel farther. Objective of increasing broadband penetration in rural areas and reducing the urban-rural divide may be achieved. For the 526-698 MHz bands, it may require considerable time for development of ecosystem. The spectrum in coverage band i.e. in 700 MHz band is already lying un-utilized for the last five years. The government should introduce new bands gradually for which the ecosystem is developed or it is likely to get developed in near future.

**Q20.** What should be associated roll-out obligations for the allocation of spectrum in 3300-3670 MHz frequency band? Kindly justify your response.

**BSNL Comments:**

No rollout obligation is recommended for the allocation of spectrum in 3300-3670 MHz frequency band due to following reasons:

- a) the high frequency waves do not travel longer due to higher propagation losses, these are not suitable for extending mobile coverage to uncovered/remote areas,
- b) the standards of IMT 2020 are still in development stage and the maturing of technology/device eco-system will take even more time.

**Q21.** What should be associated roll-out conditions for the allocation of spectrum in 24.25 to 28.5 GHz frequency range? Kindly justify your response.

**BSNL Comments:**

No rollout obligations should be casted upon the TSP for this band, as the propagation characteristics of the band allow TSP for deployment in urban dense areas and it should be left to the TSP to decide the rollout based on the throughput requirement and business potential in the particular area.

**Q22.** While assessing fulfilment of roll out obligations of a network operator, should the network elements (such as BTS, BSC etc.), created by the attached VNO, be included? If yes, kindly suggest the detailed mechanism for the same. Kindly justify your response.

**BSNL Comments:**

Yes, since the VNOs are permitted to set up their own network equipment viz., BTS, BSC, MSC, RSU, DSLAMs, LAN switches, where there is no requirement of interconnection with other Network Service Operator(s), it could create a win-win environment where it is possible for the VNO licensee to support the regime by investing in Radio Access Network. In such a situation, since both the operators have invested for provision of service, the network provider will not perceive the service delivery operator (VNO) as a competitor but as a service delivery partner that could also attract investment and strengthen the service delivery segment.

**Issues related to Spectrum Cap**

**Q23.** Whether there is a need to review the spectrum cap for sub-1 GHz bands? If yes, what should be the spectrum cap for sub-1 GHz bands. Kindly justify your response.

**BSNL Comments:**

Yes, existing overall cap of 50% in Sub GHz band is not rational and gives unfair advantage to some TSPs. Band wise cap of 35% to ensure healthy competition in telecom sector should be revoked to ensure fair allocation of natural resource.

**Q24.** Keeping in mind the importance of 3300-3670 MHz and 24.25-28.5 GHz bands for 5G, whether spectrum cap per operator specific to each of these bands should be prescribed? If yes, what should be the cap? Kindly justify your response.

**BSNL Comments:**

Yes, block size of 100 MHz and band wise maximum cap of 35% per operator holds good to ensure fair competition in telecom sector and rollout of 5G.

**Q25.** Whether there should be separate spectrum cap for group of bands comprising of 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands together? If yes, kindly suggest the cap along with detailed justification.

**BSNL Comments:**

There is no point in grouping the FDD and TDD bands for spectrum caps, as their characteristic and usage are different altogether. Anyhow, the grouping can be done

within the 1800 MHz and 2100 MHz FDD bands with maximum cap of 35% per operator. There is very low inventory left in 2300 MHz TDD band, hence there seems no justifications of grouping 2300 MHz and 2600 MHz band for the want for spectrum cap.

**Q26.** Whether overall spectrum cap of 35% requires any change to be made? If yes, kindly suggest the changes along with detailed justification.

**BSNL Comments:**

No change is suggested. India being such a vast country with one of the largest telecom market needs fair and farsighted policies to enable the market for 4-6 telecom operators, thereby preventing the market to go for duopoly. The allocation of spectrum should not only be treated as avenue to generate revenue, rather scope should be there accommodate the more players in future.

**Q27.** For computation of overall spectrum cap of 35%, should the spectrum in 3300-3670 MHz and 24.25-28.5 GHz bands be included? Kindly justify your response.

**BSNL Comments:**

There is no comparison between the bands under reference for the reasons outlined below:

- (i) Spectrum band 3300-3670MHz has already substantial deployments globally and 24.25-28.5GHzbands is the promising band for throughput requirements.
- (ii) The amount of spectrum in both the bands varies substantially.
- (iii) The valuation of the reserve price of the spectrum should be different.
- (iv) As on date only four operators are there in the market and there should be fair distribution of spectrum among them. It will be in the interest of the nation that spectrum available is distributed equally among the 04 TSPs. If not agreed, the spectrum cap of 35% should continue separately for each band.

**Q28.** Any other suggestion regarding spectrum cap may also be made with detailed justification.

**BSNL Comments:**

Existing spectrum cap in particular to Sub GHz band should be rationalize to 35% per band. As there is not much inventory available in 800 MHz and 900 MHz band for now, only band left for allocation is 700 MHz and the same should be allocated keeping in view the horizon of next 2-3 decade. Since the future spectrum allocations will be for 30 years and without fair spectrum cap further investment in Sub GHz for existing TSP or new entrant will be a road block.

Comments on each band are already given in response to Q 25 to Q 27, as above.

**Issues related to Surrender of Spectrum**

**Q29.** What should be the process and associated terms and conditions for permitting surrender of spectrum for future auctions? Kindly justify your response.

**Q30.** What provisions may be created in the spectrum surrender framework so that any possible misuse by the licensees, could be avoided? Kindly justify your response.

**BSNL Comments on Q 29 and Q 30:**

Following should be considered for the spectrum surrender framework:

- (i) Normally, TSP will surrender the spectrum when there is no ecosystem or further migration path or not able to roll out the network.
- (ii) First surrender of spectrum should be allowed after 2 years of spectrum allocation without any fee or penalty.
- (iii) Sometimes, surrender of spectrum become inevitable in case ecosystem in the

particular band is not getting developed. In such scenario the fee to be charges from the TSP, if any, should be minimal.

- (iv) No surrender fee should be charged from the operator who has paid the entire amount of auctioned spectrum upfront.
- (v) No surrender fee should be charged from the operators such as BSNL who cannot participate in the auctions rather the spectrum allocations is made administratively with matching of auctioned price. Such situation give double disadvantage to BSNL (1) the decision to get the spectrum cannot be made purely based on business viability (2) auctioned prices are very high and on many occasions few Private TSPs are participating in the auctions and utilizes the resources on sharing basis.

**Q31.** In case a TSP acquires spectrum through trading, should the period of 10 years to become eligible for surrender of spectrum, be counted from the date of original assignment of spectrum or from the date of acquisition through spectrum trading? Kindly justify your response.

**BSNL Comments:**

The surrender should be allowed after 5 years from the date of acquisition through trading.

**Q32.** Whether provision for surrender of spectrum should also be made available for the existing spectrum holding of the TSPs? If yes, what should be the process and associated terms and conditions? Kindly justify your response.

**Q33.** Whether spectrum surrender fee be charged from TSPs? If yes, what amount be levied as surrender fee? Kindly justify your response.

**BSNL Comments on Q 32 and Q 33:**

Yes, same process as applicable on allocation of spectrum.

**Issues related to Valuation and Reserve price of Spectrum**

**Q34.** Which factors are relevant in the spectrum valuation exercise and in what manner should these factors be reflected in the valuation of spectrum? Please give your inputs with detailed reasoning.

**BSNL Comments:**

The valuation of the spectrum should broadly dependent on the following:

- (i) Technical efficiency of the band i.e. coverage, capacity, etc.
- (ii) Developed global eco-system
- (iii) Quantum of available spectrum for allocation
- (iv) Past reserve prices, if any.
- (v) Duration of spectrum allocation

Due weightage should be given to the criteria mentioned above to arrive at the valuation and reserve price.

As initially, the 5G technology will be used to provide coverage in selected areas, the geographical granularity of allocation of spectrum may be considered to be reduced to LDCA. This will facilitate the reduction in the input cost by the TSPs.

**Q35.** In what manner, should the extended tenure of spectrum allotment from the existing 20 years to 30 years be accounted for in the spectrum valuation exercise? Please support your response with detailed rationale/ inputs.

**BSNL Comments:**

Generally, a technological change is seen in every 6-8 years of span. The TSP should be given both the options either to choose for 20 years of allocation or 30 years and accordingly the valuation should be extrapolated with appropriate indexing.

**Q36.** What could be the likely impact of the following auction related telecom reforms announced by the Government in September 2021 on the valuation of various spectrum bands?

- (a) Rationalization of Bank Guarantees to securitize deferred annual spectrum payment instalments in future auctions
- (b) No spectrum usage charges (SUC) for spectrum acquired in future auctions
- (c) Removal of additional SUC of 0.5% for spectrum sharing
- (d) Provision for surrender of spectrum

In what manner, should the above provisions be accounted for in the valuation of spectrum? Please support your response with detailed justification.

**BSNL Comments:**

- (i) Yes, same process as applicable on allocation of spectrum.
- (ii) Rationalization of the Bank Guarantees and no SUC for future auctions are welcome steps announced by the Government.
- (iii) As since plenty of spectrum will be available for the TSPs in future auctions, the provision for additional SUC for sharing the spectrum should continue.
- (iv) Provisions for the surrender of spectrum have already been suggested in the reply to Q.30 above.
- (v) As indicated in para 3.3 & 3.4 of the Consultation Paper (CP), it has been inter-alia acknowledged that spectrum acts as a valuable input in provisioning of telecommunication services. The telecom sector, through its backward and forward linkages, leads to large scale economic impacts such as affecting growth, employment, citizen participation etc. Hence, any policy decision which affects the prices of spectrum is reflected in the prices of telecommunication services.
- (vi) TRAI has made reference to the COAI representation regarding pricing of the spectrum and made reference to the certain observations of Parliamentary Standing Committee on Information Technology in its report on 'India's preparedness for 5G'.
- (vii) Further, DoT has also *inter-alia* recognized that:  
*"There is a need to strike balance between revenue generation from the auction on one hand, long term growth/ sustainability of the telecom sector, introduction of new services/ technologies, on the other....  
Further, spectrum lying idle is a waste for the economy."*

**Q37.** Whether the auction determined prices of March 2021 auction be taken as the value of spectrum in the respective band for the forthcoming auction in the individual LSA? Should the prices be indexed for the time gap (even if less than one year or just short of one year)? If yes, please indicate the basis/ rate at which the indexation should be done, with reasons.

**Q38.** If the answer to the above question is in negative, whether the valuation for respective spectrum bands be estimated on the basis of the various valuation approaches/methodologies being followed by the Authority in the previous recommendations, including for those bands (in an LSA) for which either no bids were received, or spectrum was not offered for auction?

**Q39.** Whether the method followed by the Authority in the Recommendations dated 01.08.2018 of considering auction determined prices of the auctions held in the previous two years be continued, or the prices revealed in spectrum auctions conducted earlier than two years may also be taken into account? Kindly justify your response.

**BSNL Comments on Q 37 to Q 39:**

The comments on Q 37 to Q 39 are same as submitted for Q 34, above.

**Q40.** Whether the valuation exercise be done every year in view of the Government's intention to have an annual calendar for auction of spectrum? Please support your response with detailed justification.

**BSNL Comments:**

The initial few years the demand of spectrum will be dependent on the development of ecosystem, telecom equipment and evolution of standards. Hence, the valuation exercise should be carried out after every three years.

**Q41.** Whether there is a need to bring any change in the valuation approaches/methodologies followed by the Authority for spectrum valuation exercises in view of the changing dynamics in the telecom sector largely due to the usage of various spectrum bands by the TSPs in a technologically neutral manner? If yes, please provide suggestions along with a detailed justification about the methodology.

**BSNL Comments:**

Spectrum should not be considered as a revenue earning source for Govt. It should be considered as an essential Infrastructure to provide base support for economic growth. The pricing of spectrum should be rational so that the telecom business be viable for TSPs.

**Q42.** In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 2500 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of substitute spectrum bands or any other reasons(s)? Please support your response with detailed justification.

**BSNL Comments:**

Non availability of sufficient ecosystem in this band is the major cause of non-utilization/lack of interest by the TSPs.

**Q43.** Whether the March 2021 auction determined prices be used as one possible valuation for the spectrum in 2300 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify your response.

**BSNL Comments:**

The same price may be used as there is very less spectrum is left in the band and sufficient interest was shown by TSPs in the auction indicates that the price was reasonable in this band.

**Q44.** Whether auction determined prices of October 2016 (i.e. for the auction held earlier than two years) be used as one possible valuation for the spectrum in 2500 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify.

**BSNL Comments:**

The price should be reviewed and it should be lesser than the reserve price for the 2300 MHz band.

**Q45.** Whether the value of the spectrum in 2300 MHz/ 2500 MHz bands should be derived by relating it to the value of spectrum in any other band by using technical

efficiency factor? If yes, which band and what rate of efficiency factor should be used? If no, then which alternative method should be used for its valuation? Please justify your response with rationale and supporting studies, if any.

**BSNL Comments:**

The comments are same as for Q 43 and Q 44, above.

**Q46.** In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 700 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of substitute spectrum bands or any other reasons(s)?

**BSNL Comments:**

- (i) The auctions of 700 MHz band have failed twice and spectrum is lying vacant for the last five years.
- (ii) The spectrum could have generated more public good has it been allocated to each TSP on deferred payment options e.g. say after 5 years of allocations.
- (iii) High spectrum reserve prices are becoming deterrent in taking interest by the TSPs. Further, as the TSP has to recover the spectrum cost over the years which results in cost of services to the end users substantially.

**Q47.** Whether the value of spectrum in 700 MHz band be derived by relating it to the value of other spectrum bands by using a technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your views with rationale and supporting studies, if any.

**Q48.** If your response to the above question is in negative, what other valuation approach(es) be adopted for the valuation of 700 MHz spectrum band? Please support your response with detailed methodology.

**BSNL Comments on Q 47 and Q 48:**

It should be completely reviewed so that the spectrum cost should not be more than 50% of the total project cost over a period of life of equipment (i.e 8 years). Besides deciding the reserve price it is proposed that the maximum price of the spectrum for each band should also be prescribed.

**Q49.** Whether the valuation of the 3300-3670 MHz spectrum band should be derived from value of any other spectrum band by using technical efficiency factor? If yes, what rate of efficiency factor should be used? If no, which other method(s) should be used for its valuation? Please justify your response with rationale and supporting documents, if any.

**BSNL Comments:**

The spectrum band 3300-3670 MHz is fresh to auctioned in India, hence, there will not be historical data for the same. The valuation of the same can be done based on the technical efficiency, global ecosystem and duration of spectrum allocation. The Authority is requested to keep the reserve prices at the lowest possible to make it affordable to the TSPs.

It should be completely reviewed so that the spectrum cost should not be more than 50% of the total project cost over a period of life of equipment (i.e 8 years). Besides deciding the reserve price it is proposed that the maximum price of the spectrum for each band should also be prescribed.

**Q50.** In case you are of the opinion that frequencies in the range 526-698 MHz should be put to auction in the forthcoming spectrum auction, whether the value of 526-698 MHz be derived by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.

**BSNL Comments:**

- (i) As per Para 3.36 of TRAI CP, it has already been indicated that *these bands are to be put to auction for the first time. Globally also, only a few jurisdictions have concluded spectrum auctions for wireless services in this band. Thus, there is a constraint of both national and international level data for this band.*
- (ii) Since the specifications of the band, band range, channel plan is also yet to be decided. Presently, part of the spectrum is being used for Digital Terrestrial Television & partly for strategic government use. Global device ecosystem may also be a challenge for these bands at this stage, hence, it is too early to comment whether the said band will be available for auctions and will be favorable considered by the other TSPs.
- (iii) Hence, the band should not be considered for auctions at this stage.

**Q51.** If your response to the above question is in negative, which other valuation approach(es) should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and any other relevant factors.

**BSNL Comments:**

The comments are same as for Q 50.

**Q52.** Whether the value of spectrum in 24.25 - 28.5 GHz band be derived by relating it to the value of other bands by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.

**BSNL Comments:**

The spectrum band in 24.25 - 28.5 GHz range is fresh to auctioned in India, hence, there will not be historical data for the same. The valuation of the same can be done based on the technical efficiency, global ecosystem and duration of spectrum allocation. The Authority is requested to keep the reserve prices at the lowest possible to make is affordable to the TSPs. It should be completely reviewed so that the spectrum cost should not be more than 50% of the total project cost over a period of life of equipment (i.e. 8 years). Besides deciding the reserve price it is proposed that the maximum price of the spectrum for each band should also be prescribed.

**Q53.** If your response to the above question is in negative, which other valuation approaches should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors.

**BSNL Comments:**

The comments are same as for Q 52.

**Q54.** Whether international benchmarking by comparing the auction determined price in countries where auctions have been concluded be used for arriving at the value of these new bands? If yes, then what methodology can be followed in this regard? Please explain.

**BSNL Comments:**

International benchmarking by comparing the auction determined price could be considered for valuation, however, the economic and social strata, development index and State wise per Capita SGDP may also be considered to arrive at the reasonability of floor price for each LSA.

**Q55.** For international benchmarking, whether normalization techniques be used for arriving at the valuation of these new bands in the Indian context? If yes, please justify your response with rationale /literature, if any.

**BSNL Comments:**

The comments are same as for Q 54.

**Q56.** Whether a common methodology/ approach should be used for valuation of all sub-1 GHz bands, which are currently planned for IMT? If yes, suggest which methodology/ approach should be used. Please give your views along with supporting reasoning and documents/ literature, if any.

**BSNL Comments:**

No common methodology/ approach should be used for valuation of all sub-1GHz bands, which are currently planned for IMT. Comments offered for Q 34 may also be referred to.

**Q57.** Whether the extrapolated ADP based on a time-series analysis, may be considered as the valuation itself or some normalization may be performed taking into account the financial, economic and other parameters pertaining to a particular auction? If yes, which factors should be considered and what methodology should be followed?

**BSNL Comments:**

The comments are same as offered for Q 34.

**Q58.** 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 justify your response.

**BSNL Comments:**

Every band should be evaluated separately and multiple valuation approach can be adopted on case to case basis.

**Q59.** 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 justify your response.

**BSNL Comments:**

The comments are same as offered for Q 58.

**Q60.** Is there any valuation approach other than those discussed above or any international auction experience/ approach that could be used for arriving at the valuation of spectrum for 700 MHz/ 800 MHz/ 900 MHz/ 1800 MHz/ 2100 MHz/ 2300 MHz/ 2500 MHz/ 3300-3670 MHz/ 24.25 - 28.5 GHz/ 526 - 698 MHz bands? Please support your suggestions with a detailed methodology and related assumptions.

**BSNL Comments:**

The comments are same as offered for Q 58.

**Q61.** Should the reserve price be taken as 80% of the valuation of spectrum? 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 and why?

**BSNL Comments:**

The flat discounting of 20% should not be applied to all the bands. The discounting should be based on the availability of the spectrum.

It should depend on the band (FDD/ TDD), spectrum available for auctions, opportunity cost of the spectrum lying idle and quantum of spectrum on offer.

**Q62.** Whether the realized/ auction determined prices achieved in the March 2021 auction for various spectrum bands can be directly adopted as the reserve price in respective spectrum bands for the forthcoming auction? If yes, should these prices be indexed for the time gap since the auction held in March 2021 and at which rate the indexation should be done?

**BSNL Comments:**

The price discovered in March 2021 auction may be used as it is. However for the new bands/ unsold bands, the reserve price should be revised.

**Q63.** Should the method followed by DoT in the previous auction in respect of collecting bid amount from the successful bidder in case spectrum is not available in a part of the LSA be followed in the forthcoming auction? Please justify your response in detail.

**BSNL Comments:**

No comments.

**Q64.** What percentage rate of upfront payment should be fixed in case of each spectrum band?

**BSNL Comments:**

Upfront payment of 20% should suffice initially. As this will provide the space to telecom operator to invest in network and subsequently, the same will be resulted in revenue generation and Government also receives substantial revenue in the form of direct and indirect taxes.

**Q65.** What should be the applicable period of moratorium for deferred payment option?

**BSNL Comments:**

The moratorium of 3 years should be allowed.

**Q66.** How many instalments should be fixed to recover the deferred payment?

**BSNL Comments:**

Ten installments on annual basis should be allowed.

**Q67.** What rate of discount should be used while exercising pre-payment/deferred payment option, in order to ensure that the net present value of payment/ bid amount is protected?

**BSNL Comments:**

It should be equal to SBI PLR.

**Issues related to Spectrum for Private Cellular Networks**

**Q68.** To facilitate the TSPs to meet the demand for Private Cellular Networks, whether any change(s) in the licensing/policy framework, are required to be made. If yes, what changes are required to be made? Kindly justify your response.

**BSNL Comments:**

The policy for Captive networks should be kept separate from the commercial networks particularly for the Government Captive networks.

The provisions for the private captive network for other than Government and strategic requirements can be allowed through commercial telecom networks as this could be one of the use cases in 5G deployments i.e. Industry 4.0. The necessary changes in the licenses can be enacted through a separate consultation for such issues.

**Q69.** To meet the demand for spectrum in globally harmonized IMT bands for private captive networks, whether the TSPs should be permitted to give access spectrum on lease to an enterprise (for localized captive use), for a specific duration and geographic location? Kindly justify your response.

**BSNL Comments:**

The provisions for the Private Captive network for other than Government and strategic requirements can be allowed through commercial telecom networks as this could be one of the use cases in 5G deployments. As such, the substantial quantum of spectrum

should be available for the normal users so as he/she is able to receive the services as per prescribed QoS.

**Q70.** In case spectrum leasing is permitted,

- i. Whether the enterprise be permitted to take spectrum on lease from more than one TSPs?
- ii. What mechanism may be prescribed to keep the Government informed about such spectrum leasing i.e., prior approval or prior intimation?
- iii. What timeline should be prescribed (in number of days) before the tentative date of leasing for submitting a joint request by the TSPs along with the enterprise, for approval/intimation from/to the Government?
- iv. Whether the spectrum leasing guidelines should prescribe duration of lease, charges for leasing, adherence of spectrum cap provisions, roll out obligations, compliance obligations. If yes, what terms and conditions should be prescribed?
- v. What other associated terms and conditions may be prescribed?
- vi. Any other suggestion relevant to leasing of spectrum may also be made in detail.

**BSNL Comments:**

Already the guidelines for Spectrum Trading and Spectrum Sharing are in force, hence, there is no need for allowing spectrum leasing. The Private Captive networks should be part of the access spectrum available with the TSPs. Spectrum leasing may result in inefficient utilization and hoarding of the spectrum. There can be a permission mechanism in place while allowing the use case of Private Captive networks for Industry 4.0.

**Q71.** Whether some spectrum should be earmarked for localized private captive networks in India? Kindly justify your response

**BSNL Comments:**

There is no need to earmark spectrum separately for localize private captive networks as it will lead to inefficient utilization of spectrum.

**Q72.** In case it is decided to earmark some spectrum for localized private captive networks, whether some quantum of spectrum be earmarked (dedicatedly) from the spectrum frequencies earmarked for IMT services and/or spectrum frequencies earmarked for non-IMT services on location-specific basis (which can coexist with cellular-based private captive networks on shared basis)? Kindly justify your response with reasons.

**BSNL Comments:**

It will not be possible to foresee and identify the territory of such requirements upfront. The use case once allowed for Industry 4.0 will be available to the TSP and it will be depending upon the requirement and business decisions of both the parties.

**Q73.** In case it is decided to earmark some quantum of spectrum for private captive networks, either on exclusive or shared basis, then

- a) Spectrum under which band(s) (or frequency range) and quantum of spectrum be earmarked for Private Network in each band? Inputs may be provided considering both dedicated and shared spectrum (between geographically distinct users) scenarios.
- b) What should be the eligibility conditions for assignment of such spectrum to private entities?
- c) What should be the assignment methodology, tenure of assignment and its renewal, roll-out obligations?

- d) What should be the pricing mechanism for assignment of spectrum in the band(s) suggested for private entities for localized captive use and what factors should be considered for arriving at valuation of such spectrum?
- e) What should be the block size and spectrum cap for different spectrum band(s) suggested in response to point (a) above.
- f) What should be the broad framework for the process of
- (i) filing application(s) by enterprise at single location, enterprise at multiple locations, Group of companies.
  - (ii) payment of spectrum charges,
  - (iii) assignment of frequencies,
  - (iv) monitoring of spectrum utilization,
  - (v) timeline for approvals,
  - (vi) Any other
- g) Any other suggestion on the related issues may also be made with details.

**BSNL Comments:**

To arrive at the detailed procedure, a separate consultation should be initiated by the Authority once the bands and floor process are determined for the forthcoming auctions.

**Q74.** What steps need to be taken to facilitate identification, development and proliferation of India specific 5G use cases for different verticals for the benefit of the economy and citizens of the Country? Kindly provide detailed response with rationale.

**BSNL Comments:**

The 5G Preparedness committee of DoT should actively involved industry, academia and operators to facilitate identification, development and proliferation of India specific 5G use cases for different verticals for the benefit of the economy and citizens of the Country

Yours faithfully



(Ved Prakash Verma)  
DGM (Regulation-II)