Telecom Regulatory Authority of India

Recommendations

On

Valuation and Reserve Price of Spectrum: 2100 MHz Band

(Response to reference of 8th January 2015 received from Department of Telecommunications on Recommendations of 31st December 2014)

15th January 2015

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CHAPTER-I: INTRODUCTION

1. On 15th October, 2014, the Authority sent its "Recommendations on Valuation and Reserve Price of Spectrum: Licences Expiring in 2015-16". On 24th November 2014 the Authority responded to DoT's queries on these Recommendations. The DoT, through its letter of 16th October 2014, requested the Authority to give recommendations on the applicable reserve price for 2100 MHz, 2300 MHz and 2500 MHz bands for all the Licence Service Areas (LSAs). On 27th November 2014, the DoT requested TRAI to expedite the process for its recommendations on the reserve price of 2100 MHz band and related issues. On 31st December 2014, the Authority sent "Recommendations on Valuation and Reserve Price of Spectrum: 2100 MHz Band" (Henceforth, the Recommendations). Both sets of recommendations and the response to DoT's queries are inextricably linked and, rightly, should be read together.

2. On 8th January 2015, the DoT conveyed that the Recommendations have been considered by the Government but, on some issues, they needed clarifications or reconsidered recommendations. Hence, the Authority was requested to take further necessary action. Para-wise responses to the DoT's back reference follow in Chapter II.

3. Before turning to the specific issues raised in the DoT's letter of 8th January 2015, it is important to put matters in perspective.

   - What is the context in which both the sets of recommendations were made?
   - What are the implications of the DoT's decisions on the spectrum auctions and the quantum of spectrum to be auctioned?
   - What is the reasoning of the Authority in making its recommendations?
   - What is the basis of valuation and setting of RP?

4. These preliminary remarks place the answers to these questions in the public domain. This is because the main purport of the recommendations seems to have been lost sight of in the attempt to deal with technicalities. This is what compels the Authority to address these critical issues upfront so that there is a clear view of the big picture.

5. To briefly recapitulate, the thrust of the Authority's recommendations of October and December 2014 were:

(i) There is a severe shortage of spectrum in both the 900 and 1800 MHz bands. Auctioning spectrum of expiring licences in such a supply- constrained situation will lead to serious problems and unintended outcomes.

(ii) Even if high auction prices are realized because of the supply constraint, the gain would be myopic. The fiscal gap would be bridged but at great cost: consumer interests would suffer, industry would not be able to find resources for further investment, and the non-performing assets of the banking sector were likely to increase.

(iii) Supply of both 900 and 1800 MHz can be augmented by unilateral action of the DoT. Specific measures were suggested. Further, 2100 MHz spectrum should be auctioned at the same time and Ministry of Defence (MoD) ought to be approached to release the spectrum.

(iv) The 2100 MHz auction of 2010 was a supply-constrained auction. The prices realized in that auction cannot be considered representative of the intrinsic valuation of spectrum in the different LSAs. And, these prices most certainly cannot be used as the sole anchor to determine reserve prices for the forthcoming auction.

(v) MoD had indicated its in-principle agreement to release 15 MHz of spectrum in the 2100 MHz Band. This spectrum can be auctioned

in February 2015 because the actual assignment of the spectrum would come very much later, towards the end of 2015. In the intervening period, outstanding issues between MoD and DoT could be resolved.

(vi) Auctions should not be split viz. one in February 2015 and one later.

6. It is perhaps best to start with the severe shortage of spectrum, as that is the core issue involved. Media reports suggest that DoT plans to auction only 5 MHz (i.e. one block) in the 2100MHz band. Though MoD has agreed, in principle, to swap spectrum leading to the additional supply of 15 MHz, this spectrum is to be auctioned later, possibly in December 2015. The Authority has already pointed out that if the swapping has been agreed to, the spectrum can be auctioned <u>now</u> with actual assignment being made much later viz. at the end of 2015. Time is on DoT's side. If indeed, the supply of 2100 MHz spectrum is restricted to 5 MHz, the supply constraint is not materially eased. The Authority had also suggested how to augment the supply of 900 and 1800 MHz spectrum. These decisions have been deferred viz. the decisions are not likely to be taken before the auction. In sum, the availability of 900 and 1800 MHz spectrum is <u>not</u> being increased. And, on top of this, the quantum of 2100 MHz spectrum is restricted. The end result of such an auction can only be what the Authority sketched in its Recommendations of October, 2014, namely, industrial distress, a sharp fall in sectoral investment, a deterioration in the quality of service and consumer difficulties (in terms of access and/or higher tariffs).

7. But, that is not all. Elementary economics shows that the 2100 MHz auction is likely to have the following implications (See Annexure- I).

(a) Since the Government controls the supply of spectrum, and if this supply is restricted to just one block, the Government could vastly

increase the reserve price just short of the highest bidder's willingness to pay and it will still effect the sale. That is to say, inflated prices not representative market discovered prices will be the outcome.

(b) While the per unit price of spectrum would be very high, such an approach does not maximise revenue. In fact, an increase in supply can yield significantly larger revenues.

(c) Since the willingness to pay depends on initial endowments (income and wealth), a supply-constrained auction only plays into the hands of incumbents with deep pockets. They are the ones most likely to win the single block of 2100 MHz on auction. This would further entrench their dominant market position, as other smaller players fall by the wayside. This cannot (and should not) be the intended outcome of a spectrum auction.

(d) Lastly, once artificially high prices are discovered in such a supply-constrained auction they will, given the predilections of the DoT, become the anchors (minimum price) for the next auction.

8. The NIA for the forthcoming auction states that:

"The Government has set itself the following objectives for the Auction:

- Obtain a market determined price of Spectrum in 2100 MHz, 1800MHz and 800 MHz bands through a transparent process;
- Ensure efficient use of spectrum and avoid hoarding;
- Stimulate competition in the sector;
- Promote rollout of the respective services;
- Maximize revenue proceeds from the Auctions within the set parameters".

9. As brought out above, most of these objectives are unlikely to be met. In a supply-constrained situation (with Government controlling the supply), it is unlikely that the discovered price can be fairly termed "a market determined price"; what is more, if overall supply is short, where is the question of any hoarding. The auction will not maximize revenue proceeds. More seriously, it cannot promote rollout because resources for investment in networks will just not be available with TSPs[1]. Lastly, rather than stimulate competition, the auction may end up restricting it.

10. This is the second time that spectrum in the 2100 MHz band is being put to auction in India. As brought out in the Recommendations, the auction realized prices in the 2010 auction were many times more than the RP set for that auction because of a serious supply constraint. Further, the demand for spectrum was conditioned by both irrational exuberance and excessive competition engendered by entry of new licencees in 2008. The Recommendations specifically drew attention to the pioneering work done by Paul Klemperer on 3G auctions in Europe in 2000 and 2001[2]. Klemperer's conclusions were two-fold. First, the initial auctions of 3G spectrum attracted very high bids and consequential winner's curse problems[3]. Second, all subsequent auctions in Europe realized far lower prices. And, all this when spectrum supply was <u>not</u> constrained. This is why the Authority pointed out the inherent risk of failure if prices for subsequent auctions in India <u>are benchmarked to prices realized in the 2010 auction.</u> Such exclusive benchmarking is fundamentally flawed. The 2010 auction prices were artificially high and certainly not

[1] As noted in the Authority's Recommendations of 15th October 2014, given the indebtedness of most TSPs and the availability of just a limited amount of resources, whatever extra is paid for spectrum, in effect, reduces the amount available for investment in the LSA (see paragraph 2.7).

[2] This was brought out in the Authority's Recommendations of September 2013 and again in 2014.

[3] The decline of British Telecom subsequent to the 3G auctions is a well documented case of a major name withdrawing from markets. See for example: Ure, John (2003) "Deconstructing 3G and reconstructing telecoms", available at http://trpc.biz/wp-content/uploads/ 2002_04_TRPC_Deconstructing3G_Workingpapers.pdf.

representative of the outcome of a normal auction. It would be simply wrong and indefensible to use those values as the sole anchor for the forthcoming auction that is being conducted after the elapse of more than four years. Recounting this thread of logic contained in the Recommendations has become necessary to clear some of the confusion arising from DoT's present back-reference.

11. Nevertheless, the Authority decided to use the 2010 auction prices (after indexation) as one possible valuation. Since the 2010 auction was the only previous instance of allocation of the 2100 MHz band, the prices revealed therein remain the only available indicator of "market-determined prices" for this band (howsoever inflated those prices were given that the supply constraint drove up prices well beyond any reasonable level). Market players will be wiser and can now be expected to factor the earlier experience while bidding for spectrum, provided sufficient spectrum is made available. If not, the Government determined supply will again inflate prices. Most importantly, the Recommendations pointed out that the Authority's approach to recent RP-setting exercises was not to benchmark RP to any single previous market price; a number of methodologies are used to arrive at a bouquet of valuations. These bottom-up valuations form the basis of arriving at an average valuation which, in turn, leads to determination of RP.

12. In addition to using indexed values of the 2010 auction prices, the Authority has relied on three other valuation approaches: technical efficiency, producer surplus on account of additional spectrum, and a model based on growth in data usage. All these approaches were put to stakeholder consultations; the approaches are grounded in either economic theory or on technical factors, are objective and scientific, and have international acceptance. Most importantly, these approaches have

been practically tested in the Indian market-place, yielding RPs that resulted in the conduct of the successful auction in February 2014.

13. A scientific valuation approach is founded on the premise that results *follow* from the methodology adopted. There can be no pre-determined valuation to be arrived at by reverse engineering viz. doctoring the methods to give the results one wants. Starting with a preconceived valuation and using it in the formulation or modification of the methodology adopted is the very antithesis of a scientific approach. Each valuation method must be tested on its own logic. The Authority is acutely conscious of its responsibility to stakeholders at large and the independence with which it is expected to act. The actions of the regulatory authority are subject to intense scrutiny from multiple sources. Any valuation exercise must be fair, objective, transparent as well as sensitive to the context in which it is done. And, it must inspire public confidence. Without that the valuations (and the Authority) lose credibility. The Authority has been guided by these considerations in valuation and RP-setting for the 2100 MHz spectrum.

14. In stark contrast, it appears as if DoT is totally and irrevocably wedded to the 2010 prices. Note the DoT's observation: "recommended reserve prices, in some LSAs for the forthcoming auction, are significantly lower than the prices achieved in the previous auction held in 2010". This suggests a pre-determination that 2010 prices are a floor. And, other observations suggest that valuation/RP cannot be lower than 2010 prices indexed for the elapse of time. If indeed indexation is the preferred methodology on which RPs are sought to be set, and, this was pre-decided, then it was futile to seek the Authority's recommendations: indexation could just as well have been done in-house.

15. That is not all. The DoT's observations referred to above conveniently gloss over the fact that in many LSAs, the RP recommended is higher

than 2010 auction price, in one case more than three times. The Recommendations specifically pointed out the lack of reliability of the 2010 prices because 83 per cent of the total realization was accounted for by Metro and Category 'A' LSAs; 17 per cent was the amount bid for all other LSAs. Surely, this cannot represent an accurate intrinsic valuation of the spectrum. What is more, the elapse of close to 5 years has seen changes in market conditions, technology, increased penetration levels, and increased demand for data. It would, therefore, be unrealistic to persevere with prices discovered more than four years ago when the relative prices of the LSAs so revealed are clearly out of kilter.

16. Cherry-picking from the Authority's recommendations is neither right nor logically defensible. Yet, this is what DoT seeks to do. Either one accepts the valuation methodologies adopted by the Authority in their entirety or one devises a different valuation methodology altogether. It is simply wrong to select those recommendations of the Authority that are convenient, by-passing others because of a mind-set to realize a pre-determined value[4].

17. The Authority's Recommendations on Valuation and RP emerged from a bottom-up (accounting for LSA specific factors), objective and transparent valuation exercise. Implicitly, the DoT's approach is indexation of 2010 prices; this would amount to pre-determining the reserve price. Given that indexation as the sole benchmark would itself be a flawed approach, indexation using SBI PLR – which has since been replaced by the SBI Base Rate – would be erroneous. The approaches are

[4] For instance, the DoT's worksheet shows the higher of two values in diametrically different ways: (a) For Metro and Category A LSAs it is the higher of the average valuation recommended by the Authority in its Recommendations and the auction price of 2010, and, (b) For Category B and C LSAs it is the higher of the reserve price recommended by the Authority and the auction price of 2010.

vastly different. It is just not right picking results first from one and then from the other.

18. The Recommendations also reiterated the need to set RP at 80 per cent of the average valuation. In the past, for reasons unknown to the Authority, DoT decided that the RP for Metro and Category 'A' LSAs, should be 100 per cent of the valuation. This, notwithstanding the fact that the Authority had provided specific academic, practical and other global experience, which clearly demonstrated that prices must be set below valuation to enable price discovery. It appears that DoT has tied itself down to previous decisions and this is why it wishes to set RP in this way. Consistency (precedent in bureaucratic parlance) has its virtues. But, if the first decision was erroneous, consistency merely implies compounding matters by repeating the same mistake; and there is no virtue in that.

19. There is a discernible pattern in the endeavour to drive up Reserve Prices (and auction realised prices) at which the 2100 MHz spectrum is sold. Leave aside the many aspects of pricing discussed above, the most telling is the reluctance to augment spectrum supply and create artificial scarcity. In no uncertain terms, the Authority would like to caution against sacrificing the sector's long-term interests at the altar of revenue realisation.

20. The Authority, in its role as an independent, arm's length regulatory body, brings to bear its expertise in discharging responsibilities under Section 11 of the TRAI Act. It is natural to expect that the executive wing would approach the Recommendations in the spirit in which they are made. Merely forwarding reports (or comments) of internal committees without policy intermediation does not serve any useful purpose, much less the objectives of overseeing the orderly growth of the sector and protecting consumer interest.

21. There is urgent need for timely action by DoT; at the same time, the action must be equitable, just and reasonable. We cannot be a prisoner to the past. The larger picture emerging from the Authority's various recommendations needs to be kept in view by DoT without succumbing to short-term targets. Policy-making must be carefully calibrated to meet industry requirements and overall consumer interest. Failure to do so cannot bode well for the economy, the country and its people.

CHAPTER-II: PARAWISE RESPONSE

1. Para 4.1

The Authority reiterates its recommendations that spectrum in the 2100 MHz band should be put to auction along with the 800/900/2100 MHz band. Furthermore, the 15 MHz of spectrum (which are equivalent to 3 blocks of 2x5 MHz when paired corresponding downlink spectrum) in the 2100 MHz spectrum being vacated by Ministry of Defence, in lieu of spectrum in the 1900 MHz spectrum, should be auctioned in view of the in-principle agreement reached with MoD, even if it is not available immediately. This is because actual assignments do not have to be made immediately. The actual date of assignment may be given in the NIA. The Authority also recommends that the DoT should take all measures to ensure that the 2100 MHz spectrum which was earlier assigned to STEL in three service areas viz. Bihar, Orissa and Himachal Pradesh is also put to auction.

DoT View

The release of 5 MHz in 2100 MHz band and also the swap of 15 MHz in 2100 in lieu of 1900 MHz band is being pursued with Ministry of Defence. Depending on availability of spectrum in 2100 MHz, quantum of spectrum to be put for auction may be decided.

Further, M/s S Tel Private Limited has filed a Petition No.438/2014 before TDSAT against withdrawal of spectrum and re-auction by DoT. Further decision on re-auction of spectrum relating to M/s STel may be taken depending on the legal advice in the matter.

In view of the above, TRAI is requested to reconsider the recommendations.

Response of TRAI

As highlighted in the Authority's recommendations on 'Valuation and Reserve Price of Spectrum : Licences Expiring in 2015-16' dated 15th October 2014, it is vitally important to auction spectrum in the 2100 MHz band along with spectrum in the 900 MHz band. The reasons for doing so have been explained in detail in paras 2.41 and 2.42 of these recommendations which were reproduced in the Authority's recommendations of 31st December 2014 in Para 2.6. The same sense of urgency was echoed by the DoT when, through its letter dated 27.11.2014, it requested TRAI to expedite the process for its recommendations on the reserve price of 2100 MHz band and related issues so that the auction of spectrum being released by Defence could be conducted along with the auction of spectrum in the 800 MHz/900 MHz/1800 MHz bands scheduled to be held in February 2015. Heeding DoT's request, the Authority delinked the 2100 MHz band from other bands- 2300 MHz and 2500 MHz band- which were part of the DoT's reference of 16th October 2014, and issued its recommendations specifically for 2100 MHz band on 31st December 2014.

In its back-reference of 08th January 2015, the DoT has not indicated the exact amount of spectrum in the 2100 MHz band that will be put to auction. However, media reports suggest that only 5 MHz is likely to be put to auction. The swapping of spectrum leading to release of an additional 15 MHz will be carried out later after the DoT notify the defence band. Quoting the Hon'ble Minister of Communications & IT, Media has reported that the notification is likely to be done in the next 45 days. Media reports also mention that the swapped spectrum in 2100 MHz may be put to auction in December 2015.

The above reports are neither a positive development nor particularly encouraging. The whole purpose of clubbing the 2100 MHz band spectrum along with spectrum of other bands for auction in February 2015 will be defeated if sufficient spectrum is not made available in the 2100 MHz band. Moreover, it was emphasized by the Authority that, if swapping has been agreed in principle, the spectrum can be put to auction and the actual assignment made after the auctions viz. once the release of spectrum is cleared by MoD. This remains a distinctly feasible option because time is on DoT's side: actual assignment can wait till end 2015, close to a year away.

As stated in para 2.8 of the Authority's Recommendations, the MoD has informed TRAI that the proposal for release of 15 MHz of spectrum in 2100 MHz band on a pan-India basis in lieu of an equal amount of commercial spectrum in the 1900 MHz band has been agreed to in principle and this has also been conveyed to the DoT. In its back-reference, the DoT has not assigned any reason for not putting this spectrum to auction in February 2015. In the absence of any plausible reason to hold back this spectrum, the Authority is not in a position to review its recommendations and, therefore, stands by them.

The Authority would also take this opportunity to sound a note of caution. If media reports are to be believed and if spectrum is auctioned in two chunks, one in February 2015 and remaining, say, in December 2015 after availability from Defence, the result would be a split auction. A split auction of 2100 MHz will artificially increase the market price of 2100 MHz in February 2015 because of the severe supply constraint. What is more, that will then become the anchor price for the next 2100 MHz auction. This situation can

be averted by putting all the available spectrum for auction in Feb 2015.

On the issue of effective utilization of spectrum which was earlier assigned to M/s S Tel and has become available due to the cancellation of its licence, the DoT has informed that S Tel has filed a Petition No.438/2014 before TDSAT against the withdrawal of the spectrum and re-auction by DoT. The DoT also stated that a decision on re-auction of spectrum relating to M/s S Tel may be taken depending on the legal advice in the matter. As can be seen from the Recommendations dated 31st December 2014 (para 2.9), the Authority was well aware of the fact that the issue was sub-judice. However, spectrum cannot be kept unutilized for an indefinite period of time as it is waste of natural resources and also results in a revenue loss to the Government in terms of licence fee, spectrum usage charges and various other levies. In its interim order, TDSAT has also given flexibility to M/s S Tel to obtain a new Unified License (UL) if they so desire. But, as per the Authority's knowledge, they have not approached DoT for obtaining a license. This is why the Authority recommended that the DoT should take necessary measures to ensure that spectrum which has become available due to the cancellation of the licence of M/s S Tel is also auctioned in the upcoming auction. However, the DoT has not given details of any action being taken or initiated by it to put this spectrum to use. Therefore, the Authority does not find any good reason to re-consider its recommendations.

In view of the above, the Authority reiterates its recommendations.

2. Para 4.2

The Authority recommends that:

(ii) A TSP, which already has a block of 2x5 MHz in the 2100 MHz band in an LSA and acquires additional block(s) in the LSA through the upcoming auction, should not be mandated to comply with the roll-out obligations prescribed above again. It would continue to be bound to the same roll-out obligations that were prescribed when it acquired the first block of spectrum in 2010.

(iii) TSTP (Test Schedule Test Procedure) which prescribes the process and method for measurements and tests to be carried out to ensure the required roll-out of the 3G network should be finalised at the earliest but, in any case, no later than the conduct of the February 2015 auction.

(iv) The list of rural SDCAs along with names of the towns in these SDCAs should be made part of the NIA.

DoT View

(ii) As the block size for auction of spectrum in 2100 MHz band is 5 MHz, existing TSPs will add substantial spectrum to their existing spectrum holding in 2100 MHz band.

In addition, it may be noted that the spectrum being auctioned is liberalised spectrum, whereby the successful bidders are permitted to use any technology subject to non-interference, etc. within the scope of the respective service license/NIA conditions.

Therefore, for ensuring proper utilisation of spectrum, the DoT opines that additional roll-out obligation should be prescribed for the existing TSPs as well, who acquire spectrum in the forth coming auction.

(iii) The TSTP (Test Schedule Test Procedure) will be developed, based on the technology used by concerned Telecom Service Provider (TSP). Currently, TSTP for 2G, 3G and BWA are available. In case of TSTP for 3G and BWA, licensees have raised certain concerns, such as grid size, etc., which are being addressed.

(iv) As the information relating to rural SDCA is already available on DoT website, there is no need to make it part of NIA.

In view of the above, TRAI is requested to reconsider the recommendations.

Response of TRAI

(ii) The Authority has recommended the same network roll-out obligations, which were mandated in the 2010 auction, for the upcoming auction. The Authority had, however, recommended reducing the time period from 5 years, which was applicable in the 2010 auctions, to 3 years to meet the prescribed roll-out obligations. Since the TSPs having spectrum in the 2100 MHz band are already bound to the same set of roll-out obligations, they ought not be required to go through testing procedures twice. That is, if a TSP has already been tested and it has been established that roll-out conditions are met, what practical purpose is served by subjecting the same TSP to another test? This is why the Authority recommended that if such a TSP acquires additional block(s) in the LSA through the upcoming auction, it should not be mandated to comply with roll-out obligations prescribed above one more time. Moreover, as per the present practice, all prescribed roll-out obligations are band-specific and not dependent on the quantum of spectrum held by a TSP or technology deployed by the TSP. For example: If, in an auction, a TSP acquires, say, 5 MHz of spectrum, while another TSP acquires, say, 10 MHz of spectrum, the second TSP cannot be asked to comply with additional roll-out obligations, merely because it has acquired more spectrum. Clearly, roll-out obligations must be quantum-invariant.

In the 2100 MHz band too, the recommended roll-out obligations ought not to be dependent on the quantum of spectrum that a licensee wins in the upcoming auction. Going by the same argument, if a licensee accumulates more than one block of spectrum in a staggered manner, its roll-out obligations should not change.

As per the provisions of the recently held auctions in the 900/1800 MHz bands, for a 'New Entrant', there were five phases of roll-out obligations and for the 'Existing Licensee' acquiring additional spectrum, there were only three phases of roll-out obligations. This is because an existing licensee was already mandated to fulfill the first two phases of roll-out obligations.

In its back-reference the DoT has argued that since the spectrum is now liberalized spectrum, "additional roll-out obligations" should be prescribed for existing TSPs as well if they acquire additional spectrum in the forthcoming auction. The Authority finds the DoT's stance inexplicable, leave aside its inherent flaws. It is not for the first time that liberalised spectrum is being put to auction. In the NIA dated 12th December 2013 for the auction of spectrum in the 1800 MHz bands and 900 MHz bands, the following provision was kept to take care of the possibility that a TSP can deploy any technology using the liberalised spectrum.

"In case of change of technology, while rolling out the networks for compliance of roll out obligations, information regarding the new technology should be given at least one year before any new technology Base Station site is offered for testing." (para 2.3)

Therefore, the Authority is not in favour of placing any "additional roll-out obligations" on existing TSPs having 2100 MHz band spectrum even if they acquire additional spectrum in the forthcoming auction. If the DoT's concern is about deployment of new technology, then the cited provision of the NIA will meet its requirements.

In view of the above, the Authority reiterates its recommendation.

However, in case, the DoT is of the opinion that the general roll-out obligations for the 2100 MHz band need revision (across the board) from what was prescribed earlier in 2010, as was done for 900/1800 MHz bands in the November 2012 auction, then the Authority recommends that a TSP which is already holding spectrum in the 2100 MHz band should be asked to comply with the incremental roll-out obligations viz. over and above what was prescribed earlier.

(iii) For making a business case and to take an informed decision while bidding for spectrum in a particular band, it is helpful to know how the mandated network roll-out will be measured. As per the prevailing device eco-system, barring a very few LTE deployments, 3G (i.e WCDMA/HSPA/HSPA+) is the only technology that is available world over in the 2100 MHz band. Therefore, in all likelihood, all successful bidders will deploy 3G in this band. Therefore, the Authority had recommended that TSTP (Test Schedule Test Procedure) for the test check of the required roll-out of the 3G network should be finalised at the earliest but, in any case, no later than the conduct of the February 2015 auction.

(iv) As per the roll-out obligations prescribed for the 2100 MHz spectrum auctioned in 2010, the licensee had to cover at least 50% of the District Headquarters in the LSA, out of which at least 15% of the DHQs should be rural Short Distance Charging Areas ("SDCA"), within five years. It was stated in the NIA, that SDCA is defined as per the definition used by the Census of India.

<u>There is no concept of SDCA in the Census of India.</u> Each settlement is classified as a Town or village only. Therefore, the Authority is of the view that the list of rural SDCAs should be mapped with the towns which a TSP needs to cover as part of its rural network roll-out obligations. Alternatively, rural roll-out obligations should be defined in terms of a list of towns. This is necessary to bring absolute clarity to the bidders as to what exactly they are required to do to meet the roll-out obligations. Accordingly, the Authority had recommended that the list of rural SDCAs, along with names of the towns in these SDCAs should be made part of the NIA. What the DoT has provided on its web-site is the list of rural SDCAs; but these are not mapped with the towns in these SDCAs. Thus, the DoT's list is not in the least helpful in apprising a TSP of how to meet its roll-out obligations.

In view of the above, the Authority reiterates its recommendations.

3. Para 4.3

The Authority recommends that in upcoming auction of 2100 MHz band spectrum, an auction-specific cap should be placed that no bidder would be permitted to bid for more than 2 blocks in an LSA if 3-4 blocks are available in that LSA.

DoT View

Spectrum cap applicable for specific band and across all bands is already in place, based on the earlier TRAI recommendations. Further, Auction specific cap may create anomalies.

TRAI is requested to reconsider the recommendations.

Response of TRAI

In its reference of 16th October 2014, the DoT did not specify the quantum of spectrum to be put to auction in the 2100 MHz band. In response to a specific query from TRAI, the DoT, through its letter dated 14th November 2014, intimated that deliberations with Defence for vacation of spectrum in the 2100 MHz band were in process and gave three distinct scenarios of availability of spectrum. There were wide variations in the likely availability of spectrum in the different scenarios. Meanwhile, MoD informed TRAI that the proposal for release of 15 MHz of spectrum in 2100 MHz band on a pan-India basis in lieu of an equal amount of commercial spectrum in the 1900 MHz band had been agreed to in principle and this had also been conveyed to the DoT. Therefore, the Authority examined the issue of imposing an auction-specific cap keeping in view the possibility that 3-4 blocks of 5 MHz would be put to auction.

Once again, in its back reference, the DoT has <u>not</u> been able to come out with any indication about the quantum of spectrum that it intends to put to auction in the 2100 MHz band, leave aside the exact quantum. Further. without giving any plausible reason, DOT has causally written back that auction specific cap may create anomalies. As brought out in the recommendations, the issue of placing an auction-specific cap is directly linked with the availability of spectrum. In the absence of any information about

the spectrum that will be put to auction in the 2100 MHz band, the Authority is not in a position to examine the issue any further and reiterates its recommendation viz. in the upcoming auction of 2100 MHz band spectrum, an auction-specific cap should be placed that no bidder would be permitted to bid for more than 2 blocks in an LSA if 3-4 blocks are available in that LSA.

4. Para 4.5

The Authority recommends that the issue of interference, reported in the 2100 MHz band in some LSAs, needs to be resolved before putting fresh spectrum blocks to auction in these LSAs. Further, it is imperative to ensure that spectrum blocks being put to auction are interference-free.

DoT View

It is noted that interference is an on-going and dynamic issue especially in border areas, and efforts are made to resolve them as per established procedure. Hence, available spectrum may be auctioned on "as is where is basis".

TRAI is requested to reconsider the recommendations.

Response of TRAI

The DoT is requested to revisit paras 2.38 to 2.41 of the recommendations dated 31st December 2014.

The interference issue at hand is not confined to some isolated parts of any one LSA. It is continuously being reported by the TSPs in parts of Punjab, Gujarat, J&K and Haryana LSA and, as brought out by one TSP, interference in the Jammu region is so high that it has not been able to launch services in that region. According to the

affected TSPs, the interference has severely impacted the quality of services in these LSAs leading to extreme customer dissatisfaction.

The interference problem has assumed serious dimensions since it has been lingering for more than two years. Further, despite being in the knowledge of DoT neither has the problem been resolved nor has DoT given any timeline for its resolution. DoT has itself acknowledged that the interference is coming from across the border.

The Authority does not agree with the DoT's bald assertion that the issue in hand is a "dynamic issue". Considering the fact that TSPs had paid market prices to acquire the spectrum, the Authority is of the view that this issue cannot be kept unresolved indefinitely, as the reference from DoT seems to suggest. In its back reference, the DoT has stated that all available spectrum may be auctioned an 'as is where is basis'. This is a classic caveat emptor, generally used while auctioning old or unserviceable goods. In such cases, the auctioneer reposes the responsibility of proper checking and inspection of the property (for any defects) on the buyer. However, in this case the Government, as the sovereign owner of the spectrum, is auctioning the right to use the spectrum for the greater public good. The TSP which buys the right to use the spectrum has to use it for meeting roll out obligations and quality of service standards. Therefore, it is the responsibility of the DoT to ensure that the spectrum being auctioned is either interference free or to share information upfront about the areas where interference is likely to occur so that the TSPs participating in the auction can take an informed decision.

In view of the above, the Authority reiterates its recommendations.

5. Para 4.6

The Authority recommends that the DoT should carry out the EMF impact study and decide within a period of 6 months whether the power radiation limits from base stations can be enhanced beyond the present limits of 20 Watts for HSPA/HSPA+ or LTE technologies.

DoT View

DoT recommends that EMF impact study may be carried out but such studies take a long time. Hence for the present, the current practice of 20 Watts for HSPA/HSPA+/LTE may continue.

In view of the above, TRAI is requested to reconsider the recommendations.

Response of TRAI

The Authority is well aware of the fact that an EMF study may take some time but keeping in view the track record of open-ended studies in the DoT, the Authority would like to re-emphasise that the study on such an important issue be conducted in a time-bound manner.

6. Para 4.8

The Authority recommends that the reserve price for 2100 MHz spectrum in each LSA should be as given in Table below:

TABLE

RECOMMENDED RESERVE PRICE PER MHz IN 2100 MHz BAND

(Rs. in crore)

LSA	*Category*	*Recommended Reserve Price*
Delhi	*Metro*	*446*
Mumbai	*Metro*	*340*

Kolkata	*Metro*	*77*
Andhra Pradesh	*A*	*183*
Gujarat	*A*	*195*
Karnataka	*A*	*241*
Maharashtra	*A*	*227*
Tamilnadu	*A*	*260*
Haryana	*B*	*44*
Kerala	*B*	*107*
Madhya Pradesh	*B*	*84*
Punjab	*B*	*65*
Rajasthan	*B*	*84*
U. P. (East)	*B*	*82*
U.P. (West)	*B*	*96*
West Bengal	*B*	*30*
Assam	*C*	*29*
Bihar	*C*	*66*
Himachal Pradesh	*C*	*10*
Jammu & Kashmir	*C*	*14*
North East	*C*	*8*
Orissa	*C*	*32*
Pan India		*2720*

DoT View

It is noted that:

(a) The para 4.7 of NIA in 2010 auction stipulates that

"If a particular round of auction for 3G spectrum or BWA spectrum takes place within 12 months from the date of completion of the current round or the relevant auction, the reserve price in such a round will be the current round of relevant auction for the respective service area."

(b) In the 2010 auction, the pan India auction determined price for 2100 MHz band was Rs.3350.11 crore per MHz. These are now four year old auction prices.

(c) In case of liberalization of spectrum in 1800 MHz band, last auction price indexed to SBI PLR rate is to be charged.

(d) In the TRAI recommendations of October 2014, methodology used for arriving at reserve price for 1800 MHz was to compare the estimated value with the last auction and take the higher of the two.

(e) In the current TRAI recommendations on 2100 Band, the average expected valuation for each LSA has been worked out as a simple mean of the four valuation approaches that have been adopted (indexation, using SBI Base rate, of 2010 auction determined prices of 2100 MHz auction spectrum, technical efficiency factor of 0.83 times of 1800 MHz spectrum valuation, producer surplus model and approach based on growth in data usage). However, it is also noted that comparison with last auction price has not been done.

(f) The TRAI in its recommendations has fixed reserve price at 80% of average valuation for each LSA.

(g) The spectrum being auctioned is liberalized spectrum.

Taking note of the above, it is further observed the following:

(a) The Government has decided in the earlier auction of February 2014, that the reserve price in case of Metro and Category 'A' licensed service areas (LSAs) would be without applying the multiplication factor of 0.8. It is of the view that the factor of 0.8 may not be applied in case of Metro and Category 'A' LSAs.

Response of TRAI

(a) The Authority has repeatedly pointed out that the reserve price must not be equal to the expected valuation. The setting of a reserve price is an exercise distinct from the valuation exercise. The Authority has been of the consistent view that a reserve price should not be fixed too close to the estimate of valuation, so as to encourage participation, enable competitive bidding and lead to price discovery. The Authority had, as a general principle, recommended that reserve price should be fixed at 80% of the average valuation (See paras 3.51 to 3.59 of the Authority's September 2013 Recommendations). The theory and practice on how to set reserve prices was elaborately spelt out in the September 2013 Recommendations. The Authority cited academic and other sources in support of its stance. The Recommendations relating to setting of reserve prices (and their logical foundation) hold good across all spectrum bands put to auction. The Authority has adhered to this principle consistently in all recent recommendations. The Authority is unaware of the theory and rationale underlying the Government's decision not to apply the factor of 0.8 to the valuation for setting reserve prices in Metro and Category 'A' LSAs. DoT's observations appear to suggest that it would like the Authority to endorse its unfounded approach. There is no plausible reason for the Authority to do so, namely, change its view in the matter. The Authority reiterates all its recommendations on reserve prices for the forthcoming auction of 2100 MHz spectrum.

DoT View

(b) The TRAI recommended reserve prices, in some LSAs for the forthcoming auction, are significantly lower than the prices achieved in the previous auction held in 2010.

Response of TRAI

(b) Since 2013, the reserve prices recommended by the Authority emanate from scientific and objective valuation methodologies based on a far more accurate bottom-up approach. The approach used hitherto (before 2013) was top-down and fundamentally flawed for reasons explained in the Authority's Recommendations of September 2013. The bottom-up approach takes into account LSA-specific factors to arrive at respective valuations. When undertaking the valuation exercise, the Authority does not (and should not) have any pre-determined price in view. If it were so, the valuation itself would be suspect. The results that are reported emerge from the scientific and objective methodologies used.

The DoT's observation reveals only half the story and amounts to cherry-picking. The fact of the matter is that the RPs are lower in the case of the 8 Metro and Category A LSAs; in the case of Category B LSAs, only in three LSAs is the RP either marginally lower than or almost the same as the 2010 auction price. The December 2014 Recommendations specifically noted that the competitive pressure to buy spectrum was especially high in Metro and Category 'A' LSAs; the contribution of Metro LSAs was almost 43% of the total auction-determined price and that of Category 'A' LSAs was another 40% of the total. That is to say, 83% of the total bid values can be ascribed to Metro and Category 'A' LSAs, leaving a paltry 17% of the bid value for all the other LSAs. Clearly, this cannot be an accurate or representative estimate of the inherent value of 2100 MHz spectrum. The 2010 auction prices were artificially high principally because of the supply constraint and this has been explained in detail in the December 2014 Recommendations. Therefore, the Authority is of the view that there is no merit in directly comparing

the results arising from its bottom-up valuation exercise with the 2010 auction prices that are more than four years old.

DoT View

(c) Last auction determined price for a band should generally be a guiding benchmark for determining the reserve price for that band in subsequent auction. This methodology has been adopted by TRAI in case of 1800 MHz band reserve price. However, it is not clear as to why TRAI has not adopted this method of benchmarking with last auction price of 2010 while recommending the reserve price of 2100 MHz band. Prices calculated using this methodology are indicated in Annexure-1.

Response of TRAI

(c) Any benchmarking of the average valuation of spectrum using past auction determined prices can be considered only when the auction has been conducted in the recent past and the underlying demand, supply and market conditions have not changed materially over the time period[5]. The comparison of reserve prices with previous auction realised prices is relevant only if the exercise of determining the reserve price takes place within one year; DoT has itself acknowledged this by referring to para 4.7 of the 2010 NIA. When the Recommendations of October 2014 on reserve prices of 1800 MHz spectrum were firmed up, the auction prices of February 2014 were only 8 months old. The results of this auction clearly revealed that there was no supply constraint, as there was unsold spectrum in as many as 11 LSAs. The reasons for accepting the benchmark of the previous auction (February 2014 auction) prices were also explained in Para 3.61 of the Recommendations. The short point is that since the February 2014 auction was <u>not</u> supply

[5] See September 2013 Recommendations on why indexation was rejected as a valuation method.

constraint, prices discovered in that auction are representative of market prices.

In contrast, the 2010 auction of 2100 MHz spectrum was undoubtedly supply-constrained. The Authority has repeatedly adverted to the constrained supply and the irrational exuberance in that auction that led to artificially high prices. There was aggressive demand, conditioned by excessive competition engendered by entry of new licensees in 2008 especially in capacity constrained markets. And, as pointed out in the Recommendations, the first auction of 3G spectrum has universally been characterized by the 'winner's curse' type of problem; all subsequent auctions revealed much lower prices. There have been significant changes in the techno-economic landscape of the telecom sector in the four-and-a-half years since 2010. These include learning from the experience of three spectrum auctions held in November 2012, March 2013 and February 2014, as well as technological developments.

Therefore, the DoT's observation misses the point that the auction determined price of 2010 can neither be taken into account as the <u>only value</u> of 2100 MHz spectrum (with or without indexation) nor can it be used for any benchmarking in the valuation exercise. To do so would be sheer folly. In view of the above, the Authority reiterates its recommendations on valuation and reserve price of 2100 MHz spectrum for the forthcoming auction.

DoT View

(d) Another benchmark for comparing the average valuation could be the last auction determined price of 2010 indexed to SBI PLR. Prices calculated using this methodology are also indicated in Annexure-1.

Response of TRAI

(d) In its December 2014 Recommendations, the Authority used the indexed value of the 2010 auction price as one possible valuation to arrive at the average valuation and reserve price of the 2100 MHz spectrum. This was done notwithstanding the intense opposition of most stakeholders during the consultation process. And, the numerous drawbacks surrounding such indexation were brought out in the Authority's Recommendations (see para 3.5 and 3.6).

If indeed benchmarking to the 2010 auction price (whether indexed using SBI PLR or Base Rate) was the DoT's intention all along, there was no requirement of even referring the matter of valuation and reserve price to the Authority. Such indexation surely could have been done by the DoT on its own. Since the reference was made by DoT, the Authority took a considered decision to adopt the SBI Base Rate for indexing the 2010 auction price (to be used as one possible valuation). The reasons for adopting the Base Rate have been set out in para 3.7 of the December 2014 Recommendations which clearly states the 'base rate system' has replaced the benchmark PLR system with effect from 1st July 2010, and would be applicable for all new loans and for those old loans that come up for renewal. The Authority notes in this context that the payment terms in the NIAs for the auctions conducted in November 2012, March 2013 and February 2014 indicated an interest rate that is equal to the prevailing SBI Base Rate. The Authority does not agree with the DoT's observation that the last auction determined price of 2010 "indexed to" (sic) SBI PLR can be used as another benchmark or the sole anchor price for the average valuation (and reserve price) for the forthcoming auction. (Please also see response to (c) above which brings out that the 2010 revealed prices could not possibly

represent an accurate valuation of spectrum. This calls into question using the 2010 prices as a benchmark leave aside using it as the sole basis of valuation).

7. Other Issues arising from the recommendations

DoT View

Spectrum Usage Charges (SUC): It is noted that no recommendations has been made with respect to Spectrum Usage Charges (SUC) by the TRAI. Hence, TRAI is requested to provide recommendations on rates of SUC for 2100 MHz band.

Response of TRAI

In its Recommendations of September 2013 on 'Valuation and Reserve Price of Spectrum', the Authority had recommended that spectrum acquired through auction or trading or on which a TSP has paid the prescribed market value to the Government should not be added to any existing spectrum holdings for determining the applicable slab rate. It was further recommended that the SUC for <u>all</u> auctioned spectrum should be at a flat rate of 3% of AGR for wireless services (see paras 5.31 and 5.33 of the Authority's September 2013 Recommendations). The Authority's Recommendations are not restricted to any particular spectrum band and are auction-invariant. This position has been clarified to the DoT three times already. DoT is requested <u>not</u> to refer this matter back to the Authority again and again. The Authority reiterates its recommendations of September 2013 on SUC.

DoT View

Payment Terms: Taking note of the fact that in the previous auction of 2100 MHz band, 100% upfront payment was stipulated and therefore,

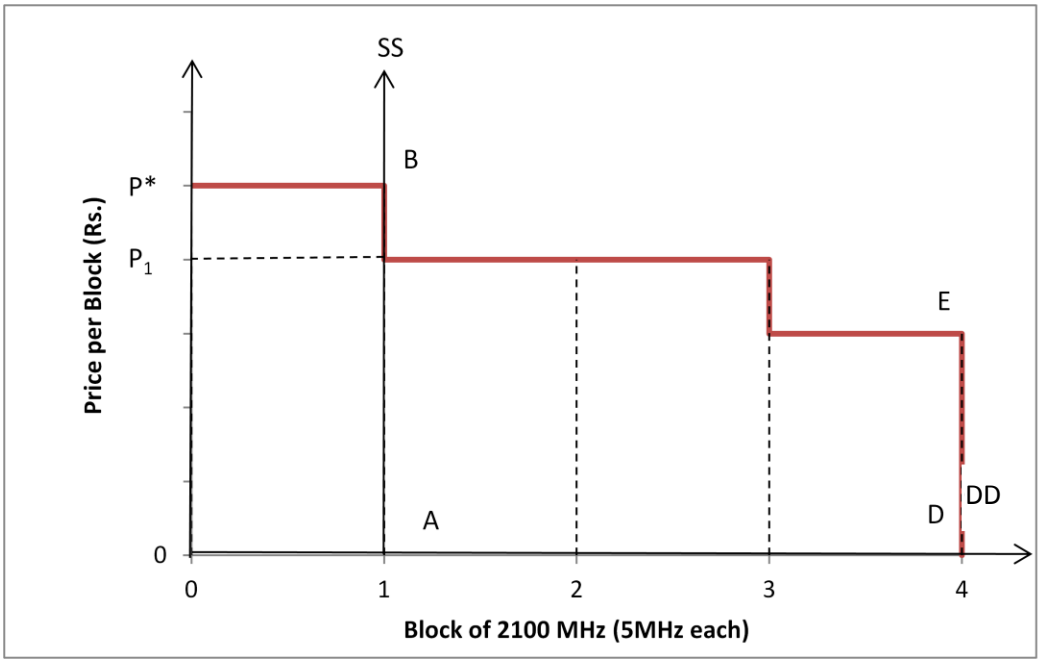
TRAI is requested to provide reconsidered opinion/clarification on payment terms and condition for auction of 2100 MHz band.

Response of TRAI

As stated in its September 2013 Recommendations, the Authority is of the view that the structuring of the payment terms is a matter that needs to be decided by the Government factoring in, amongst other things, the current budgetary requirements. The decision on the matter is solely the prerogative of the Government and the Authority would, therefore, not wish to make any specific recommendation in this regard.

Annexure-I

Figure: 1
Auction under supply constraint



P* denotes the highest bidder's maximum willingness to pay for one block of 2100 MHz spectrum.

DD curve denotes the demand for 2100 MHz spectrum by the bidders. SS denotes the supply of blocks of 2100 MHz spectrum by the Government, which is fixed at 5MHz (1 block).

In case only one block of 2100 MHz spectrum is put to auction, if the reserve price is greater than OP_1, then the spectrum will sell at the reserve price. If the reserve price is less than OP_1, then the spectrum will sell at $OP_1 + \delta$ (i.e small increment over OP_1) at which point bidding will end.

This can be explained in terms of equation as follows:

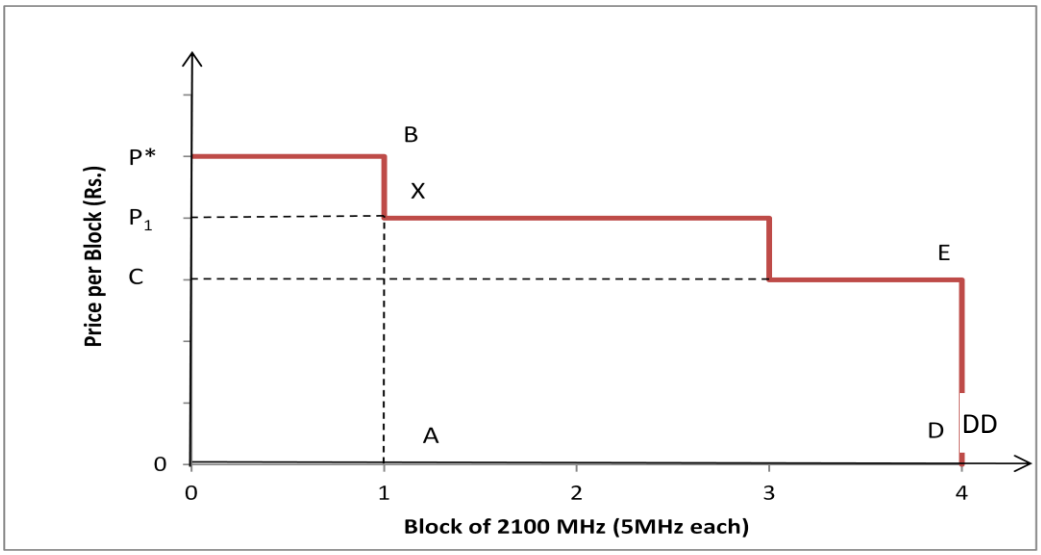
If RP > OP_1

=> Sell at price = RP (Maximum RP = OP*)

If RP < OP_1

=> Sell at price = $OP_1 + \delta$

Figure: 2
Revenue from auction



P* denotes the highest bidder's maximum willingness to pay for one block of 2100 MHz spectrum.

DD curve denotes the demand for 2100 MHz spectrum by the bidders.

If one block of 2100 MHz spectrum is put to auction and reserve price is set anywhere between 'O' and 'C', OP_1 will be the auction-determined price. In this case, the reserve price will not have any effect on the final auction price and the bidder will pay OP_1 because of the supply constraint and competition in the bidding (i.e. demand for spectrum). Revenue to Government will be equal to OP_1XA.

In another scenario if four blocks of 2100 MHz spectrum are put to auction (which increase the supply of spectrum), the final auction price will be OC and revenue to Government will be equal to OCED which is much higher than OP_1XA.

This can be explained in terms of equations as follows:

<u>When one block of 2100 MHz spectrum is put on auction;</u>

If RP<OC,

Market clearing price will be OP_1 and;

Revenue to Government = OP_1XA

<u>When four blocks of 2100 MHz spectrum are put on auction;</u>

If RP<OC,

Market clearing price will be OC and;

Revenue to Government = OCED

It can be seen from the graph that OCED >> OP_1XA