Annexure 1

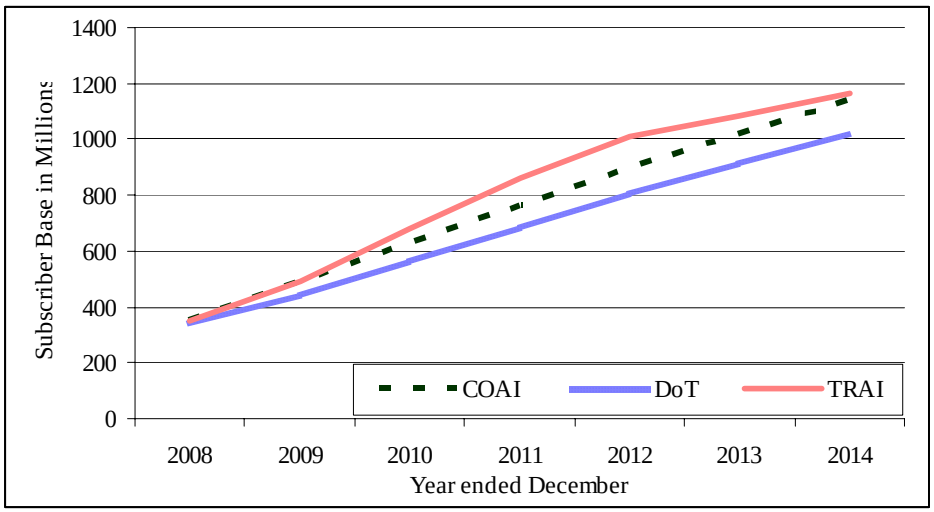
# Chapter 1
# Spectrum requirement and availability

**1. Do you agree with the subscriber base projections? If not, please provide the reasons for disagreement and your projection estimates along with their basis?**

a) **Yes, we are in agreement with the subscriber base projections made by the Authority**.

b) In fact, it is submitted that the subscriber projections made by COAI are more or less in line with the forecasts by the DoT Spectrum Committee (May 2009) as well as the Authority.

c) The comparative subscriber projections of DoT Spectrum Committee (May 2009), TRAI (pro-rated to end December) and COAI upto 2014 are as below:




**2. Do you agree with the spectrum requirement projected in ¶ 1.7 to ¶1.12? Please give your assessment (service-area wise).**

a) It is most respectfully submitted that any estimates on future spectrum requirement will vary with the base assumptions made to arrive at those projections and as rightly noted by the Authority, these can at best, be considered as indicative figures.

b) It is further submitted that **it may be more relevant and practical for the Authority to consider and base its recommendations on current and future likely availability of spectrum in the various bands identified for wireless/mobile services**.

**<u>Spectrum requirements for GSM</u>**

c) We do however note that the spectrum projections for GSM are based on the views of an "eminent technical expert" who has opined that 2X8 MHz is sufficient for an

operator (i) to deploy a 2G network with reasonable levels of spectrum efficiency, and (ii) to satisfy the subscriber needs in the densest areas.

d) We would appreciate if the Authority could share with us the name of the expert whose views have been relied upon as also the basis and justification (copy of the report) for the conclusions presented in the Consultation Paper.

e) In this regard, it may be noted that the Authority, in its Recommendations on Spectrum Related Issues dated May 13, 2005, had stated:

> *"..The allocation of spectrum to operators in India has been much below international benchmarks leading to inadequate planning and network building by operators…*
>
> *…spectrum allocation to GSM operators is inadequate and in comparison to the International averages of 2 X 20 MHz, the Indian operators have only been allotted 2 X 4.4 to 2 X 10 MHz. This prevents proper planning by operators…*
>
> *…the existing spectrum allocation for 2G services in India is much below world average … Authority considers that our responsibility is to ensure the availability of additional spectrum to the service providers so that shortage of spectrum does not come in the way of growth of telecom services in the country…"*

f) It may be further noted the DoT Spectrum Committee Report (May 2009) states that :

> *"From a regulatory standpoint, it is important to create a market situation wherein most operators have sufficient spectrum to be operating at or above the saturation point of efficiency while at the same time allowing enough competition in the marketplace…in the case of GSM, …the saturation point beyond which spectrum efficiency does not exceed significantly can be taken as 12+12MHz for GSM"*

The assumptions and calculations of the Committee are given in Section II.(2) and Appendix A4 of its Report.

g) It is submitted that the COAI agrees with the views of the DoT Spectrum Committee (May 2009) and those voiced by the Authority in 2005.

h) It may also be noted that irrespective of an assumption of 8MHz or 10MHz or 12MHz, it is clear that under any circumstances, even all the available spectrum in the GSM bands is not sufficient to meet the requirements of all the existing players. It is submitted that this issue must be addressed specifically by the Authority to ensure all existing players of adequate spectrum.

**Consideration of 1900MHz band for CDMA**

i) Insofar as the requirements of the CDMA operators are concerned, we note that the Authority has taken into account 2X7 MHz in the 450 MHz band and 2X10MHz in the 1900MHz band.

j) In this regard, it is most respectfully submitted that allocation of any spectrum to CDMA in the 1900MHz band ought not to be even considered by the Authority as the same will cause severe interference in 3G services as the downlink of this band is co-adjacent to the uplink of the 2.1GHz band that is being auctioned for 3G services.

TRAI Spectrum Recommendations and Aegis Committee Report-2005

k) The fact of interference has been established by several studies carried out by independent agencies, including those commissioned by the Authority itself.

l) In this regard, we would like to take the liberty to recall the Authority's attention to its recommendations on Spectrum Related Issues dated May 13, 2005, which contained extracts from the Report of International Expert Agency Aegis commissioned by the Authority, which states :

> *"The proposal… of giving 2X10 MHz (1910-1910MHz paired with 1980-1990MHz) "has a high probability of being unworkable"*
>
> *"TRAI must decide whether to permit this operation on the balance of risk. For an operator the proposal may appear technically manageable and therefore workable provided all the spectrum was under its control. But, for a Regulator, other broader factors must also be considered in addition and the consequences if interference does occur may warrant a more conservative approach."*

With regard to the Mixed IMT-2000 2GHz and PCS 1900 bands, the Report states

> *"Because of the nature of interference, TRAI would not be able to guarantee interference free operation and would therefore need to consider if it would be held liable in any way for the impact of interference. TRAI would need to consider who pays for the modification of existing systems to mitigate the effects of interference."*

TRAI Spectrum Recommendations and IIT Report- 2006

m) Furthermore, even the Authority's recommendations dated September 13, 2006 on Allocation and Pricing of 3G and BWA, the Authority noted that

- If one considers this 2 x 10 MHz allocation proposal, there is a possibility that the CDMA base station transmitter operating between 1980-1990 MHz will interfere with the WCDMA base station receiver operating in the 1920-1980 MHz range and reduce the capacity of the WCDMA system.
- In addition, the WCDMA handsets will cause interference with the CDMA handsets, leading to possible worsening of quality of service.
- As a result, any allocation in the PCS1900 band in addition to the 2.1 GHz band will require interference mitigation measures, which might impose additional costs on both the systems.

n) Furthermore, the recommendations contained in the findings of a Report by IIT, Delhi commissioned by the Authority, which presents the same conclusions that resulted from the earlier round of consultations. This is despite the fact that IIT has increased the guard band from 5MHz to 10MHz (resulting in further wastage of spectrum. As per the IIT report too, even after keeping a guard band of 10MHz, the following steps would need to be taken for implementation of a mixed band plan, i.e.

- Installation of filters by both GSM and CDMA operators.
- Operators will have to plan their networks to keep a vertical spacing between collocated WCDMA & EVDO base stations or have sufficient space between the base stations if they are at the same height.

o) However, despite the above, the Authority recommended to DoT that industry representatives, equipment vendors, telecom experts and the Government should conduct the trial to verify the possibility of co-existence of PCS1900 and 2.1 GHz systems and the feasibility of the mixed band plan at the earliest.

Mixed Band Plan Field Trials – 2008

p) It may be noted that the above field trials were conducted subsequently (without the involvement of the GSM stakeholders) and the results of the same were not conclusive despite the fact that the trials were performed in an almost lab like environment. The Committee noted that :

- The measurements/observations were carried out only for co-sited antennae; however in a practical situation, it is possible that the WCDMA and CDMA antennae may not always be co-sited.
- The observations were under almost lab like conditions with only a limited number of handsets at specific locations of both systems operating.
- There was a need to approve the test schedules and thoroughly observe the test equipment set up, site configurations, drive tests and analysis of various observations to understand the possible implications of such mixed band operations.

q) The Committee has accordingly recommended that further trials need to be conducted before arriving at firm conclusions on feasibility with

- Duly approved test schedules, site and antenna configurations
- Distributed BTS antennas (facing each other and in close range) along with co-site locations (looking in the same direction)
- Sufficient time for carrying out detailed measurements.

A copy of the Report of the above trials is enclosed as Annexure-1A

r) COAI believes that the mixed band plan should not even be considered by the Authority until the interference free operations in a practical/real-life environment on a fully loaded system is conclusively established and the same is duly certified by the standardization bodies like, 3GPP and 3GPP2.

**700 MHz Band**

s) We note that the Authority has, in Para 1.11 assumed that 108 MHz in the 700 MHz band will be used for providing both Broadcasting as well as LTE services.

t) In this regard, we understand that the broadcasters have been allocated spectrum in various bands viz. 100 MHz, 200 MHz, 470-580 MHz, etc and we believe that the spectrum requirements of the broadcasters can be adequately met in these bands.

u) On the other hand, we would like to submit that the mobile industry would be requiring the full 108 MHz to provide mobile broadband services.

v) For our detailed submissions in this regard, please refer to our response to Issues 5 and 6 below.

**3. How can the spectrum required for Telecommunication purposes and currently available with the Government agencies be re-farmed?**

a) It is suggested that **the Authority may recommend the setting of an independent Committee of Experts who may examine the entire gamut of spectrum bands that can be deployed for commercial use and lay down a roadmap on vacation of the same**.

**b)** In terms of immediate priority we would like to submit that **the 700 MHz and 2.5 GHz bands in FDD duplexing mode are crucial for the aggressive growth and evolution of mobile broadband services and that these bands may be prioritized for vacation and re-farming.**

**4. In view of the policy of technology and service neutrality licences, should any restriction be placed on these bands (800,900 and 1800 MHz) for providing a specific service and secondly, after the expiry of present licences, how will the spectrum in the 800/900 MHz band be assigned to the operators?**

a) Whilst **COAI is of the view that the current UAS Licensees permit the licensees to offer all types of Access Services, Internet Telephony, Internet Services as also Broadband services including triple play i.e. voice, video and data**, it also believes that the level playing field has been disturbed on account of the dual spectrum allocation policy which has allowed the CDMA operators to have enough surplus spectrum, to offer in-band 3G EVDO services.

b) COAI believes that the above inequity is a direct result of more spectrum being administratively allocated to one set of operator, which has allowed the said operators to not only offer dual technology services but also evolve to 3G EVDO on a selective and preferential basis vis-à-vis other operators.

c) Insofar as the expiry of licenses and re-assignment of spectrum is concerned, it may be noted that the DoT Spectrum Committee (May 2009) has recommended:

> *"At the end of the license period when the assigned spectrum reverts back to the licensor, the licensee holding the spectrum till date should be given the first right of refusal for the same spectrum for the next twenty years. The licensee must exercise the choice not later than 6 months prior to expiry and*

*pay a fee. This fee is to be administratively determined and publicised by the licensor annually (say, on April 1), based either on (a) a recent auction of spectrum in the circle , or a comparable one at that time, or (b) extrapolation from past auctions , or (c) escalation based on some formula. In case the licensee refuses the offer, the spectrum should be auctioned for a period of twenty years."*

**d) We agree with the above view of the Committee that at the end of the license period, the licensee holding the spectrum till date should be given the first right of refusal for the same spectrum for the next twenty years.**

**5. How and when should spectrum in 700 MHz band be allocated between competitive services?**
**&**
**6. What is the impact of digital dividend on 3G and BWA?**

a) Today, most countries around the world are moving towards closure of analog television signals and plans have been made to take advantage of the move to digital television to free up precious radio spectrum for other uses.

b) The Authority has however, rightly pointed out that in India, the digital dividend band is largely unused.

c) COAI is of the view that the band 698-806 MHz is ideally placed for Mobile Broadband services because of its excellent propagation characteristics. This band will allow mobile operators to provide cost-effective and seamless broadband experience, allowing for improved rural coverage and better quality coverage in urban areas.

d) It is submitted that for many emerging markets, the digital dividend represents a unique opportunity to leapfrog into the broadband world. Studies have shown that a 10% increase in mobile broadband penetration leads to a GDP increase of upto 1.4%.

e) COAI is of the view that particularly in developing countries, mobile broadband technologies such as HSPA and LTE can do for broadband availability what GSM did for voice.

f) COAI is thus of the view that allocation of the full 698-806 MHz band for mobile broadband is essential if the industry is to continue to deliver the social and economic benefits that are being enjoyed by both developed and developing nations.

g) From an industry point of view, COAI believes that the most efficient solution in the 698-806 MHz band is a FDD duplexing mode with a 2 X 50 MHz arrangement (with 8 MHz center gap), as it will:

- Deliver large contiguous blocks of spectrum for mobile broadband.
- Maximize the use of limited spectrum available in India and is hence the most spectrally efficient arrangement.

- Avoid the potential fragmentation of the band thereby reducing the complexity of the terminals.
- Ensure better co-existence with adjacent radio communication (broadcast) services with reverse duplex arrangement.


**(2x50 MHz)**

h) We believe that the early vacation and allocation of this spectrum to mobile services would accelerate the shift to wireless broadband.

i) The Authority may be aware that while Regions 1 and 2 have already adopted their respective band plan arrangements, Region 3 (including India) is yet to finalize its band plan arrangements for 700MHz. We believe that in Region 3, India will be one of the key markets to drive economies of scale by leading the initiative to develop a band plan for Region 3 and can thus advocate/push for adoption of the above-mentioned band plan in order to provide affordable mobile broadband services and to help develop a knowledge-based economy.

**j) The industry thus needs a clear and timely decision on allocation of digital dividend spectrum as well as harmonized channeling arrangements / band plan. This will enable the industry to invest early and with confidence in the future of mobile broadband and the services that it will deliver. This will also provide alternative evolution opportunity for operators who have not succeeded in the 3G/ BWA auction, to provide wireless/mobile broadband services.**

## Chapter 2
## Licensing issues

**7. Should the spectrum be delinked from the UAS Licence? Please provide the reasons for your response.**

**a) Yes, COAI is of the view that spectrum should be delinked from the UAS Licence.**

b) We note that the Authority too has repeatedly recommended de linking the license from the spectrum. The Authority, in its recommendations dated August 28, 2007 on Review of License Terms, etc, has stated:

> *" Today the spectrum allocation follows grant of UAS License. On payment of certain entry fee, the applicant is given the license and subject to availability, he is given a certain amount of spectrum in the 2G band. In case the applicant does not require this spectrum for providing the access service, he may want to use only wire-line or may want to provide services*

*using some other spectrum, e.g. BWA, there is no clear cut path for him. He is required to pay the full license entry fee. The Authority in the past has also recommended that the license fee should be separate from the spectrum fee. With the advent of new technologies where spectrum other than 2G band will be used, resolution of this issue is becoming critical. As recommended earlier, the Authority again reiterates that spectrum should be de-linked from the licensing regime. There is also a need to clearly specify the license fee charges without spectrum. The Authority is of the view that license fee charges should be on a reduced scale to facilitate penetration of telecom services. Bifurcating present entry fee in to license fee and spectrum charge is difficult. It is also a fact that entry fee determined in 2001 does not bear any relationship to present spurt in the telecom market. Keeping in mind that spectrum is a scarce resource, the Authority recommends that the DoT should examine the issue early and specify appropriate license fee for UAS licensees who do not wish to utilize the spectrum."*

c) The DoT Spectrum Committee (May 2009) too has recommended de linking of spectrum and UAS Licence

**8. In case it is decided not to delink spectrum from UAS license, then should there be a limit on minimum and maximum number of access service providers in a service area? If yes, what should be the number of operators?**

a) As submitted above, **we are in favour of de linking spectrum from UAS license**.

**9. What should be the considerations to determine maximum spectrum per entity?**

a) It may be noted that the DoT Spectrum Committee (May 2009) has recommended:

*"Licensees should be permitted to consolidate spectrum holding up to the maximum amount that can be held by an operator without restricting competition. It is noted in the existing merger guidelines of intra-service area UAS and CMTS licenses (DoT, 2008) that the mark share of a merged entity shall not be greater than 40% either in terms of subscriber base Adjusted Gross Revenue. If this rule is applied, this would automatically mean that the must be at least three operators in each circle. Since competing operators may not all ha similar market share, it is more reasonable to assume that there must be at least four operators to ensure that this limit is satisfied. This means that no operator should hold more than 25% of the total spectrum assigned in a service area in the bands listed in Paragraph I1-2(b) for the UASL/ CMTS services, irrespective of technology mix, deployed by the operator. Since the average amount of spectrum assigned per service area is 2 X 75 MHz, the cap allows operators to hold up to 2 X 18.75 MHz on average per service area. This is roughly similar to the international average holding per operator."*

**b)** We agree with the above view of the Committee. In fact, we would like to go a step further and submit that **the maximum spectrum per entity be pegged at 25% of the**

**total quantum of commercial spectrum assigned in the service area, irrespective of technology mix and/or spectrum band deployed.**

**10. Is there a need to put a limit on the maximum spectrum one licensee can hold? If yes, then what should be the limit? Should operators having more than the maximum limit, if determined, be assigned any more spectrum?**
**&**
**11. If an existing licensee has more spectrum than the specified limit, then how should this spectrum be treated? Should such spectrum be taken back or should it be subjected to higher charging regime?**

**a)** It is reiterated that **the maximum spectrum held by a licensee may be prescribed at 25% of the total quantum of commercial spectrum assigned in a service area, irrespective of technology mix and/or spectrum band deployed**.

b) It is submitted that **all spectrum allocations have been made in accordance with prescribed guidelines/norms and no spectrum in excess of what was permissible has been granted to any operator**.

c) It may be noted that the DoT, in a matter before the Hon'ble TDSAT, has stated on affidavit that:

> *"... allotments of spectrum were made in accordance with the norms prevailing at the stage of allotment. ...*
>
> *...to achieve the objectives of continued growth of telecom services, further spectrum beyond 2 x 6.2 MHz has also been allotted to various operators, as per guidelines/ orders/ criteria in force at the time of such allotment. These criteria have been formulated and appropriately reviewed periodically, taking into account TRAI recommendations and development of technological features, etc.*
>
> *It is thus the case of these respondents that no spectrum in excess of what was permissible has been granted to any mobile operator.*
>
> *The issue of criteria, allotment of additional spectrum and pricing are the part of normal spectrum management functions and accordingly orders in this regard were issued as, a part of normal procedure.*
>
> *The additional spectrum to GSM operators were allotted as per guidelines, orders and eligibility criteria prevalent on the respective dates of allotment. The Service Licence agreement provides the licensor the right to modify and/ or amend the procedure of allocation of spectrum including quantum of spectrum at any point of time without assigning any reason.*
>
> *The additional spectrum to GSM operators, beyond the initial spectrum had been allotted, as per the guidelines, orders and subscriber based edibility criteria prevalent on the respective dates of allotment. The allotments were made subject to availability of spectrum as well as enabling provision enshrined in the service License Agreement."*

**d) In light of the above, the question /issue of "taking back" spectrum or subjecting it a "higher charging regime" does not arise.**

**12. In the event fresh licences are to be granted, what should be the Entry fee for the license?**
**&**
**13. In case it is decided that the spectrum is to be delinked from the license then what should be the entry fee for such a Licence and should there be any roll out condition?**

a) It is once again reiterated that we are in favour of de-linking spectrum from UAS License. This has also been the view of the Authority and is also the recommendation of the DoT Spectrum Committee (May 2009).

b) As regards the Entry Fee for a license de-linked from spectrum, the Authority has examined this issue and made certain recommendations in this regard in its recommendations on Unified Licensing dated January 13, 2005.

c) Further, in its recommendations on Review of License terms, etc dated August 28, 2007, the Authority whilst recommending delinking of UAS license and spectrum had opined that for a license de-linked from spectrum,

> *"…license fee charges should be on a reduced scale to facilitate penetration of telecom services…."*

d) The DoT Spectrum Committee (May 2009) whilst recommending de-linking of spectrum and UAS license has opined that

> *"..The license fee itself should be taken to reflect the cost of obtaining the privilege to offer services as specified in the license…"*

**e) In light of the above, the Authority may consider and recommend a suitable entry fee for a license de-linked from spectrum.**

f) Insofar as the issue of rollout is concerned, it is submitted **that once there is no spectrum linked to license, the licensee cannot have any wireless/mobile rollout obligations**.

**14. Is there a need to do spectrum audit? If it is found in the audit that an operator is not using the spectrum efficiently what is the suggested course of action? Can penalties be imposed?**

a) We believe that **there is no requirement for carrying out a spectrum audit, irrespective of whether the spectrum is auctioned or allocated through a subscriber linked criteria.**

b) **In this regard**, **we note and agree with the DoT Spectrum Committee** (May 2009) that

> ***"****A market-determined mechanism for spectrum allocation will ensure that spectrum goes to the entity that puts the highest value on spectrum, and is best placed to ensure its optimal use…. Any inefficiency in the use of spectrum is sure to be penalized by market forces and does not need to be administratively monitored."*

**15. Can spectrum be assigned based on metro, urban and rural areas separately? If yes, what issues do you foresee in this method?**
**&**
**16. Since the amount of spectrum and the investment required for its utilisation in metro and large cities is higher than in rural areas, can asymmetric pricing of telecom services be a feasible proposition?**

**a) We are strongly of the view that spectrum should continue to be assigned and priced on a service area wise basis.**

b) It is our view that **it would neither be practical nor useful for spectrum to be assigned separately for urban and rural areas**, because

- Trying to divide up the service area into rural and urban blocks would be an administratively complex and extremely micro-managerial task which will be impossible to administer and enforce.
- An area which is rural today will surely evolve over the years to a semi-urban /urban area making such artificial distinctions irrelevant over the long term.
- Also, the same spectrum that is used to deliver high capacity in the urban areas can be used in the rural areas to achieve greater coverage thereby balancing an operator's capital expenditure on infrastructure to offer more affordable services.

c) There would also be an issue on applicability of charges. Asymmetric pricing of spectrum will carry with it the same challenges and limitations of asymmetric allocation. How will the spectrum manager/service provider keep track of the revenues arising from each block for the purpose of spectrum usage charges?

d) It is thus submitted that spectrum should continue to be allocated and priced on a service area wise basis.

e) Insofar as pricing of telecom services is concerned, it is first submitted that cellular tariffs have been on forbearance since September 2002 when the Authority had taken the view that

> *"…a stage has been reached, when market forces can effectively regulate cellular tariff and the Regulator has to step aside except for a broad supervision in the interest of the consumer."*

It is submitted that the competitive scenario has intensified significantly since then making micro-management and regulatory intervention in respect of tariffs neither necessary nor desirable.

f) It may also be noted that the cost of providing services to rural areas is far higher given the huge cost of capital and infrastructure for rollout, which would lead to

higher tariffs for such areas. This would go completely against the national objectives of increased penetration and more affordable services in the rural areas.

**g) We are therefore strongly of the view that mobile tariffs should continue to be under forbearance and spectrum allocation and pricing should continue to be on a service-area wise basis.**

## M&A issues

**17. Whether the existing licence conditions and guidelines related to M&A restrict consolidation in the telecom sector? If yes, what should be the alternative framework for M&A in the telecom sector?**

**a)** Yes. **We are of the view that the present M&A guidelines do not facilitate consolidation of the sector.**

b) We **believe that the primary reason for the above is on account of the restrictive provisions pertaining to spectrum**. It may be appreciated that one of the key resources in an M&A transaction is spectrum and any provisions that require the merged/acquiring entity to surrender spectrum that has been obtained through a market based transaction is bound to reduce the incentive and attraction of such a transaction.

c) We believe that it would be **highly desirable to review the M&A guidelines so as to allow the merged/acquiring entity to retain the entire spectrum through the transaction subject to the overall spectrum cap of 25%** of the total commercial spectrum assigned in a service area irrespective of technology mix and/or band deployed.

**18. Whether lock-in clause in UASL agreement is a barrier to consolidation in telecom sector? If yes, what modifications may be considered in the clause to facilitate consolidation?**

a) We believe that in a sector where the entry has thus far been unlimited and unrestricted, it is anomalous to prescribe a high exit barrier through the imposition of lock in provision.

b) **We are thus not in favour of any lock-in provisions under license**.

**19. Whether market share in terms of subscriber base/AGR should continue to regulate M&A activity in addition to the restriction on spectrum holding?**

a) It is re-iterated that the merged/acquiring entity should be allowed to retain the entire spectrum subject to the overall spectrum cap of 25% of the total commercial spectrum assigned in a service area irrespective of technology mix and/or band deployed.

b) I**n respect of market share, we note that the Authority has earlier** (TRAI recommendations on Intra Circle M&As dated January 30, 2004) **taken the view that** :

*"The international practice is normally to use number of subscribers as indicator for computing the market share. In our opinion also, for the purposes of Mergers & Acquisitions, subscriber numbers should be the preferred criterion to compute the market shares. If market share is defined on the basis of revenues then despite having lower subscribers, an operator may have higher market share on account of higher ARPU. In general, the focus of sustained anti-competitive activity is to wean away subscribes through unfair competition. Higher share in revenues compared to that for subscriber base would imply higher ARPUs, which are normally difficult to sustain over time if the other operators aggressively seek additional market share and high revenue subscribers.* ***We, therefore feel that subscriber base would be an adequate criteria*** *for our purpose."*

**c) We are in agreement with the view taken by the Authority in 2004 and believe that subscriber base should be an adequate criterion for determining market share.**

**20. Whether there should be a transfer charge on spectrum upon merger and acquisition? If yes, whether such charges should be same in case of M&A/transfer/sharing of spectrum?**
**&**
**21. Whether the transfer charges should be one-time only for first such M&A or should they be levied each time an M&A takes place?**

a) We note that the DoT Spectrum Committee (May 2009) has stated in its Report that

*"Government may have legitimate concerns that licensees who have not acquired spectrum at market price, could use this opportunity to sell scarce spectrum at a premium and make windfall gains. This concern can be addressed by imposition of a one-time charge payable to the licensor for the first such transfer/merger/sharing. It is imperative, however, that the charge applied for sale/merger/sharing of spectrum should be set at a level that does not discourage consolidation. Such a fee will ensure that a licensee does not make a windfall gain simply by trading in a scarce commodity. Subsequent trading of spectrum should not attract a further transfer charge since the holder would have already paid a market-determined price. The transfer can be for any amount of spectrum, and the fee should be charged on a per-MHz (1 + 1 MHz duplex pair) basis. Since spectrum assignment is coterminus with access license, the expiry-date of a spectrum block sold may vary with the seller. The transfer/merger/sharing charge will have to be pro-rated based on the residual life of the spectrum."*

*"While levying charge on the transfer/merger of spectrum may not ensure that the full value of the spectrum accrues as revenues to the Government, it will ensure that spectrum reaches the hands of an entity that values it the most and will be able to put this scarce resource to its most efficient and optimal use. It is this efficient and optimal use of the spectrum resource that should be the primary objective of the Government, rather than the maximization of revenues."*

*"Spectrum transfer charges are to be collected by Government only on the first transfer of the spectrum. Since each spectrum assignment is in a separate distinguishable frequency, it would be easy to determine if a sale is a first sale, or, if it is subsequent to an earlier sale or auction for a given frequency."*

*In order to activate the market at the earliest, the transfer / merger charge discounted by 20 % for one year from the date of announcement of policy.*

*"The same fee should apply irrespective of whether the spectrum is being transferred, or acquired through a merger, or shared."*

**b) We agree with the above views and recommendations of the Committee and urge the Authority to kindly consider the same.**

**22. Whether transfer charges should be levied on the lesser or higher of the 2G spectrum holdings of the merging entities?**

a) We note that the DoT Spectrum Committee has recommended that:

*"The application for transfer/merger of spectrum must be made by the licensee to whom the spectrum has been assigned, and upon grant of permission, the requisite transfer/merger charge must be paid before effecting transfer. The same fee should apply irrespective of whether the spectrum is being transferred, or acquired through a merger, or shared. …. In the case of merger, transfer charge will be payable on the lesser of the 2G spectrum holdings of the merging entities."*

**b) We agree with the above views and recommendations of the Committee and urge the Authority to kindly consider the same.**

**23. Whether the spectrum held consequent upon M&A be subjected to a maximum limit?**

**a) The maximum limit on spectrum for an M&A transaction may be prescribed at 25% of the total commercial spectrum assigned in a service area irrespective of technology mix and / or spectrum band deployed.**

## Spectrum Trading

**24. Is spectrum trading required to encourage spectrum consolidation and improve spectrum utilization efficiency?**

**a)** Yes. We believe that introduction **of spectrum trading would be desirable for encouraging spectrum consolidation and improving spectrum utilization efficiency.**

**25. Who all should be permitted to trade the spectrum?**

**a)** We believe that **any licensee/entity holding spectrum in any band should be permitted to trade the same.**

**26. Should the original allottee who has failed to fulfill "Roll out obligations" be allowed to do spectrum trading?**

a) We believe that **fulfillment of rollout obligations should not be prescribed as a pre-requisite for permitting spectrum trading by original allottees**.

**27. Should transfer charges be levied in case of spectrum trading?**

**a) There should be no distinction between spectrum transferred through an M&A transaction or traded directly in the market.**

b) It is however reiterated that **the transfer charges should apply only in the case of the first transfer/ merger/ trade and only when the spectrum so transacted has been assigned other than through a market mechanism**.

**28. What should be the parameters and methodology to determine first time spectrum transfer charges payable to Government for trading of the spectrum? How should these charges be determined year after year?**

a) **The DoT Spectrum Committee (May 2009) has already recommended transfer charges** that may be applied to M&A, trading or sharing of spectrum. The **methodology, assumptions and parameters** taken into account by the Committee to arrive at its recommendations are detailed in Annexure A5 of the Report.

b) The Committee has further recommended that :

- In order to activate the market at the earliest, the transfer / merger charge should be discounted by 20 % for one year from the date of announcement of policy.

- The transfer / merger charge may be revised by the licensor annually based on price discovery from auctions and other similar inputs.

**c)** The **Authority may kindly consider the above recommendation of the Committee to address this issue.**

**29. Should such capping be limited to 2G spectrum only or consider other bands of spectrum also? Give your suggestions with justification.**

**a)** It is reiterated that the **maximum cap on spectrum may be prescribed at 25% of the total commercial spectrum assigned in a service area, irrespective of technology mix and/or spectrum band deployed.**

b) This is because the spectrum bands already allocated or are in the process of being allocated through the imminent 3G, EVDO and BWA auctions are all IMT identified bands capable of offering similar /equivalent functionality of services. It would thus be both incorrect as well as undesirable to prescribe different caps for different bands

/ technologies. This will only lead to administrative complexity and enforcement issues.

**30. Should size of minimum tradable block of spectrum be defined or left to the market forces?**

**a)** It is submitted that **the minimum size of the trading block will depend upon the a number of factors,** viz. spectrum band, technology, channeling plan, etc **and it would be impossible to define it upfront.**

**31. Should the cost of spectrum trading be more than the spectrum assignment cost?**

**a)** We believe that **the value of spectrum will ultimately be determined by the market.**

## Spectrum sharing

**32. Should Spectrum sharing be allowed? If yes, what should be the regulatory framework for allowing spectrum sharing among the service providers?**
**&**
**33. What should be criteria to permit spectrum sharing?**

a) As rightly noted by the Authority, there can be different types of spectrum sharing arrangements that can be entered into by licensees. It is submitted that **it must first be clearly specified what activities will be permissible under "spectrum sharing"**

b) In respect of the **regulatory framework for spectrum sharing, we note that the DoT Spectrum Committee (May 2009) has already laid down the broad principles and framework** for spectrum sharing. Relevant extracts from the Committee Report are reproduced below:

> *"Sharing of 2G spectrum amongst UAS/CMTS licensees will become feasible if the annual spectrum usage charges are made uniform for all bands irrespective of amount of spectrum held. The Committee is of the view that if annual spectrum charges are made uniform as recommended in Chapter V, Government may permit sharing of spectrum also, along with transfer of spectrum through sale or merger. Sharing of spectrum is not permitted amongst UAS/CMTS licensees who opt not to pay an up-front charge for additional spectrum assigned to them prior to 17. 1.2008 beyond 6.2 + 6.2 MHz. Sharing should be permitted on payment of sharing charges' to the Government for the quantity of spectrum shared, in the same manner and of like amount as applicable in case of transfer or merger of the spectrum.*
>
> *Sharing makes economic sense only when the full spectrum is shared between the operators in a service area. It should, therefore, be permitted only when two or three GSM or CDMA operators share their entire spectrum holding in a license area. When two operators share spectrum, sharing charges shall be levied on the smaller of the two spectrum blocks being shared. In case three operators share spectrum, sharing charges shall be levied on the smaller two spectrum blocks being shared.*

*Since spectrum sharing arrangements may sometimes unravel, the policy may also provide for retention of sharing charges only to the extent leviable for the actual period (part of the year will be taken as full year) of the sharing on a prorata basis, and refund of the difference. In case of subsequent sale or merger of the spectrum, transfer charges or merger charges as the case may be will be payable, prorata on the balance period of the spectrum assignment.*

*In case of sharing of spectrum, each licensee will have the benefit of the aggregate shared spectrum. For the purpose of assessing the total 2G spectrum holding of a UAS/CMTS licensee, the total shared spectrum will be counted in the hands of each licensee. In case one of the licensees sharing spectrum has already fulfilled the roll-out obligations, there will be no further penalties on any of the licensees sharing spectrum. In the case where none of the licensees has fulfilled the rollout obligations, penalties for unfulfilled rollout obligations will be applicable on each licensee separately.*

*The Wireless Advisor is required to monitor compliance with the various technical conditions of the spectrum license such as interference, power limits and transmission within assigned frequencies. In case of sharing it will be necessary to prescribe responsibility jointly and severally for compliance of license conditions of the entire shared spectrum."*

**c)** We **urge the Authority to kindly consider the above recommendations to address this issue.**

**34. Should spectrum sharing charges be regulated? If yes then what parameters should be considered to derive spectrum sharing charges? Should such charges be prescribed per MHz or for total allocated spectrum to the entity in LSA?**

a) As submitted above, the **sharing charges may be prescribed at the same level as transfer charges for M&A or spectrum trading**.

**b)** The sharing charges **may be prescribed on a per MHz basis.** Also, as recommended by the DoT Spectrum Committee (May 2009), these charges **should be levied/applied on the smaller of the two spectrum blocks being shared when two operators share s**pectrum and **in case three operators share spectrum, sharing charges should be levied on the smaller two spectrum blocks being shared.**

**35. Should there be any preconditions that rollout obligation be fulfilled by one or both service provider before allowing the sharing of spectrum?**
**&**
**36. In case of spectrum sharing, who will have the rollout obligations? Giver or receiver?**

a) We believe that **fulfillment of rollout obligations should not be made a condition precedent for sharing of spectrum**.

b) Further, as recommended by the DoT Committee, we believe that if any one of the licensees sharing spectrum has fulfilled its rollout obligations, the same may be considered as fulfilled by all the licensees sharing spectrum.

## Perpetuity of licences

**37. Should there be a time limit on licence or should it be perpetual?**

**a) The DoT Spectrum Committee (May 2009) has recommended that the license be made perpetual as long as the licensee pays the annual license fee and meets the license conditions.**

b) The **Revised Information Memorandum issued by DoT** for auction of 3G, EVDO and BWA spectrum provides **that the UAS /CMTS license with respect to that spectrum will get extended to 20 years from the award of the said spectrum.**

c) We believe that **the licenses may be extended by 20 years at a time instead of the 10 years as at present.**

**38. What should be the validity period of assigned spectrum in case it is delinked from the licence? 20 years, as it exists, or any other period.**

a) It is first submitted that **at present,** the license and spectrum are bundled and **the validity of the spectrum assignment is co-terminus with the validity of the license**. Thus, spectrum assigned to a licensee at different points of time over the tenure of the license has different validity periods. It would thus not be correct to state the current validity of spectrum allocations as it exists, is 20 years.

b) It is however suggested that **once the spectrum is allocated independently through an auction, the spectrum may assigned with a validity period of 20 years, which is made further extendable by 20 years at a time** on mutually agreed terms and conditions.

c) In this context, it may be noted that the DoT Spectrum Committee (May 2009) has stated

> *"As per the current policy, spectrum rights assigned to licensees are co-terminus with the period of license, which is 20 years from the grant of license. Even though different parcels of spectrum are received by a licensee at different points in time, they all have validity upto the same date, i.e., upto the expiry of UASL/CMTS….At the end of the license period when the assigned spectrum reverts back to the licensor, the licensee holding the spectrum till date should be given the first right of refusal for the same spectrum for the next twenty years."*

**39. What should be the validity period of spectrum if spectrum is allocated for a different technology under the same license midway during the life of the license?**

a) It is submitted that **under the prevalent regime, all spectrum that has been assigned under license till date, whether under dual technology or otherwise, is**

**co-terminus with the license** under which the said spectrum has been allocated and the validity of the spectrum assignment will cease with the expiry of the license.

**b)** As pointed out above, **the DoT Spectrum Committee (May 2009) has also noted that as per the current policy, spectrum rights assigned to licensees are co-terminus with the period of license and they all have validity upto the same date, i.e., upto the expiry of UASL/CMTS.**

**c)** **The in-principle approval issued to the CDMA operators for use of dual spectrum, clearly states that:**

> *"..The **effective date of existing UAS licence**(s) and other terms & conditions **shall remain unchanged**."*

**d)** In light of the above, we would like to strongly submit that **all spectrum allocated under the license, whether for the same technology or "for a different technology under the same license midway during the life of the license" cannot have a validity beyond the validity of the license itself.**

**40. If the spectrum assignment is for a defined period, then for what period and at what price should the extension of assigned spectrum be done?**
**&**
**41. If the spectrum assignment is for a defined period, then after the expiry of the period should the same holder/licensee be given the first priority?**

a) We note that the DoT Spectrum Committee (May 2009) has recommended that

> *"At the end of the license period when the assigned spectrum reverts back to the licensor, the licensee holding the spectrum till date should be given the first right of refusal for the same spectrum for the next twenty years. The licensee must exercise the choice not later than 6 months prior to expiry and pay a fee. This fee is to be administratively determined and publicised by the licensor annually (say, on April 1), based either on (a) a recent auction of spectrum in the circle, or a comparable one at that time, or (b) extrapolation from past auctions , or (c) escalation based on some formula. In case the licensee refuses the offer, the spectrum should be auctioned for a period of twenty years."*

**b)** We **agree with the above recommendations of the Committee that the licensee holding the spectrum till date should be given the first right of refusal for the same spectrum for the next twenty years and urge that the same may be recommended by the Authority as well.**

## Uniform License Fee

**42. What are the advantages and disadvantages of a uniform license fee?**
&
**43. Whether there should be a uniform License Fee across all telecom licenses and service areas including services covered under registrations?**

&

**44. If introduced, what should be the rate of uniform License Fee?**

a) At present, different rates of license fee are applied to different segments of the telecom sector.

**b)** It may be appreciated that as service providers are increasingly becoming integrated operators and further, with the onset of convergence, the **imposition of differential license fee across various telecom services, s**uch as Access, Internet, NLD/ILD etc. **is leading to complications and problems in administering, thereby causing concerns regarding possible opportunity for arbitrage or misreporting of revenues**

c) There also exists an anomaly wherein the burden of license fee is higher on the more capital intensive Access Service, whereas the same is lower at 6% for NLD/ ILD services.

**d)** We are of the firm view **that there should be a uniform levy across various telecom licenses as the same will not only ensure level playing field but will also reduce administrative problems and also eliminate all concerns regarding arbitrage and enforcement.**

**e) A uniform License Fee has also been repeatedly advocated and recommended by the Authority.**

f) The Authority in its recommendations on Unified Licensing dated January 13, 2005 has stated:

> *"Since for the services being offered, the service providers are charged service taxes of 10%, we are of the view that the maximum level of license fee should not exceed the contribution towards USF and Administrative fee. The present level of USO contribution is 5% and the level of Administrative fee shall be 1% of AGR presently. Therefore it is recommended that for Unified License, Class License and Niche operators the License fee shall be (contribution to USF (5%) + Administrative cost (1%)) i.e. 6% of Adjusted Gross revenue (AGR). The administrative cost is required for managing, licensing and regulating the sector."*

g) Uniform license fee was once again recommended by the Authority in its Recommendations on components of Adjusted Gross Revenue (AGR) dated September 13, 2006, where it stated:

> *"The Authority observed that many service providers are now integrated operators and provide all telecom services. Since licence fee on number of services is charged at different rates, it is possible for the service providers to book revenues in such a manner that licence fee liabilities are minimized. The Authority noted that recently DoT has brought a few services at par for payment of licence fee. The Authority therefore observed perhaps a uniform rate licence fee regime could obviate the recourse of diverting revenue from one service and booking it to another where incidence of licence fee is lower."*

**h)** In light of the above clear advantages, **we would like to urge the Authority to consider and recommend a flat/uniform license fee across all licenses and also peg the same at 1%+5% as per its earlier recommendations.**

## Chapter 3
## Spectrum assignment

**45. If the initial spectrum is de-linked from the licence, then what should be the method for subsequent assignment?**
**&**
**47. In case a two-tier mechanism is adopted, then what should be the alternate method and the threshold beyond which it will be implemented?**

a) We believe that once spectrum is de-linked from license, the same should be allocated through a market based mechanism, viz. auction.

b) In this context, we note that DoT Spectrum Committee has recommended that

- All assignments of 2G spectrum in future should be through auction.
- Government should move to uniform spectrum usage charges, irrespective of quantum of spectrum and irrespective of technology, at the same time as it is moving to a market based mechanism for spectrum assignment and for mergers/transfer of spectrum.
- Since the weighted average rate of the spectrum usage charge at present works out to 3.35% of AGR and the Government will also get revenue from auction and through the transfer charges on transfer / merger / sharing, uniform rate could be set at 3 % of AGR per annum
- UAS/CMTS licensees who have obtained additional 2G spectrum beyond 6.2+6.2 MHz in an LSA prior to 17.1.2008 should be given the option of paying an upfront charge for the spectrum beyond 6.2+6.2 MHz based on the 3G auction price pro-rated per MHz for the remaining period of spectrum assignment from the date when annual spectrum usage rates become uniform or a subsequent date from which they exercise the option. The Committee goes on to state that once this option has been exercised by the Licensee, the annual spectrum usage charges for the spectrum held would become uniform (3% of AGR), instead of the higher rate being levied at present

c) It is submitted that the above approach recommended by the Committee, disadvantages such operators who currently have an allocation of 4.4MHz and are paying a usage charge of 2% of AGR, as they will not only be required to pay a higher usage charge of 3% of AGR, but will also be required to pay a market discovered price for their next tranche of spectrum. This would tantamount to imposing a double and unfair burden on these operators and also create a non level playing field for them vis-à-vis other operators who got the additional spectrum of 1.8MHz only upon paying a higher revenue share spectrum usage charge of 3% of AGR.

d) It is submitted that this anomaly can be corrected by reducing the flat spectrum usage charges to 2% of AGR and auctioning spectrum beyond 4.4MHz. We believe that the

revenues of the Government will be assured and will also increase steadily even at a rate of 2% of AGR, as Government will earn :

- A correspondingly higher bid price (in both 2G as well as 3G as also any other auctions) leading to higher upfront revenues for the Government.

- A higher amount as one time up front fee as a part of the migration by operators to a flat charge regime.

- Steady increase in the amount collected as annual usage charges on account of the growth in the revenues of the operators.

**46. If the initial spectrum continues to be linked with licence then is there any need to change from SLC based assignment?**

**a)** It is once again re-iterated that **spectrum and UAS license should be de-linked.**

**48. Should the spectrum be assigned in tranches of 1 MHz for GSM technology? What is the optimum tranche for assignment?**

a) We believe that **in the case of 2G, GSM spectrum can be assigned in tranches of 1MHz.**

**49. In case a market based mechanism (i.e. auction) is decided to be adopted, would there be the issue of level playing field amongst licensees who have different amount of spectrum holding? How should this be addressed?**

a) It is submitted that **even under the prevalent regime, different licensees /operators are holding different amounts of spectrum**.

**b) A market based mechanism (auction) will only change the procedure by which spectrum is assigned.**

**c)** It is submitted that **a market based allocation of spectrum will ensure that the spectrum that goes into the hands of the entity that values it the most and is thus best placed to ensure its optimum use.**

**50. In case continuation of SLC criteria is considered appropriate then, what should be the subscriber numbers for assignment of additional spectrum?**

**a)** At the outset, it is submitted that **we do not believe that there is a case for continuing with SLC.**

b) In this regard, **we note that the DoT Spectrum Committee (May 2009) has highlighted the limitations of the SLC** and stated that :

> *"As we go forward, it has become increasingly difficult for an administratively determined SLC to keep pace with fast-changing subscriber profiles, increasing use of data-centric applications, randomized network growth, and rapid technological developments in data transmission.*

*Firstly, rapid advances in technology, with some advances translating to significant spectral efficiency gains on the ground and others not being so useful, make the determination of the SLC complex and contentious.*

*Secondly, there are vast rural and suburban areas in most LSAs where the spectrum assigned already is more than sufficient to support a much larger subscriber base, and the growth in the number of subscribers is determined mainly by the demand for service, which is changing (increasing) with time. At the same time, the service providers need additional spectrum in the dense urban areas. This disconnect between rural / suburban (where the majority of population resides) subscriber growth, and need for spectrum in urban areas, makes periodic revision of the SLC difficult.*

*Thirdly, the use of SLC deters the expansion of data -centric services. Spectrum needed for data services to a given subscriber base could otherwise be used to provide voice services to a larger subscriber base, making the licensee eligible for more spectrum.*

*Fourthly, as more new spectrum bands are made available for various wireless telecommunications services such as mobile TV, Broadband Wireless access, operators are likely to be holding several bands simultaneously, and servicing subscribers using a combination of bands. It will not be possible to segregate subscribers in different bands in order to determine subscriber numbers for a particular band in order to apply the SLC.*

*Finally, there is the issue of migration of spectrum to higher generations of wireless technology. For example, in the EU, migration from 2G to 3G technology is being considered in the bands in which 2G technology is being currently deployed. Going forward it will be very difficult for the spectrum licensor to follow different methods of assigning spectrum for the same generation of technology in different bands. It has already been decided that spectrum in the 1.9 GHz (paired with 2.1 GHz) band for 3G technology will be auctioned, as will be spectrum for Broadband Wireless Access in the 2.3 GHz and 2.5 GHz bands. There are many services that are common to 2G, 3G, and BWA technologies, all of which can be offered by a UAS licensee. In this scenario, if additional spectrum in the bands specified in Paragraph 2(b) continues to be given without an up-front fee based on SLC for deployment of 2G technology, it creates a problem for migration to next-generation technology on the same spectrum at a later* date, *since others would have paid for spectrum in other bands for deploying the same technology."*

*"It is therefore desirable and feasible that other methods be considered for the allocation and pricing of spectrum. The way forward should be to move away from an administratively determined criteria to a market-driven approach. A market-determined mechanism for spectrum allocation will ensure that spectrum goes to the entity that puts the highest value on spectrum, and is best placed to ensure its optimal use."*

c) We also note that **the Authority too, has brought out the shortfalls and deficiencies in the SLC approach**. In its recommendations of Review of License Terms etc. dated August 28, 2007, the Authority has noted that :

> *"The present spectrum allocation criteria, pricing methodology and the management system suffer from a number of deficiencies…..*
>
> *The … subscriber-base criteria …method of spectrum allocation has a number of limitations and problems, especially in the current market environment.*
>
> *Some of the gaps in the present framework for spectrum allocation are mentioned below:*
>
> *The criterion does not consider subscriber base density across service areas. .*
>
> *The criterion does not account for subscriber distributions within service areas. …*
>
> *… This results in inefficient use of spectrum in majority of the service area. These criteria have led to attempts at over reporting of the subscriber base. Given that spectrum is a vital input to cellular operations, and one that can significantly impact costs, these criteria create incentives for over reporting. While some of this problem might be addressed with verification and VLR reporting (and not HLR), the possibilities and incentives are not eliminated.*
>
> *The subscriber-base allocation criterion also causes problems from a network planning perspective. …*

d) The Authority, in its above recommendations of August 2007 had recommended the setting up of a multi-disciplinary committee to address this issue.

e) The First Committee set up by DoT in pursuance of the above recommendations recommended the setting up of another Technical Committee to specify the method to be followed for allocating incremental spectrum and emphasized that the said Technical Committee should leverage all available expertise in the country, particularly the academic expertise available from the IITs, IISc, IIMs, and other research bodies..

f) Such a Committee was set up by DoT in June 2008 and the said Committee after extensive deliberations, has recommended the auction of spectrum in May 2009.

g) **We agree with the views and recommendations of the DoT Spectrum Committee (May 2009) and urge that we move away from an administratively determined subscriber linked criteria to a market-driven approach for allocating spectrum**.

**51. In your opinion, what should be the method of assigning spectrum in bands other than 800, 900 and 1800 MHz for use other than commercial?**

**a)** We believe that **hereafter all commercial use spectrum, irrespective of bands should be auctioned.**

## Spectrum pricing

**52. Should the service providers having spectrum above the committed threshold be charged a one time charge for the additional spectrum?**
**&**
**53. In case it is decided to levy one time charge beyond a certain amount then what in your opinion should be the date from which the charge should be calculated and why?**
**&**
**54. On what basis, this upfront charge be decided? Should it be benchmarked to the auction price of 3G spectrum or some other benchmark?**

**a)** As submitted above, **it is reiterated that all spectrum allocations have been made in accordance with prescribed guidelines/norms and no spectrum in excess of what was permissible has been granted to any operator.**

b) It may be noted that the DoT, in a matter before the Hon'ble TDSAT, has stated on affidavit that:

> *"... allotments of spectrum were made in accordance with the norms prevailing at the stage of allotment. ...*
>
> *...to achieve the objectives of continued growth of telecom services, further spectrum beyond 2 x 6.2 MHz has also been allotted to various operators, as per guidelines/ orders/ criteria in force at the time of such allotment. These criteria have been formulated and appropriately reviewed periodically, taking into account TRAI recommendations and development of technological features, etc.*
>
> *It is thus the case of these respondents that no spectrum in excess of what was permissible has been granted to any mobile operator.*
>
> *The issue of criteria, allotment of additional spectrum and pricing are the part of normal spectrum management functions and accordingly orders in this regard were issued as, a part of normal procedure.*
>
> *The additional spectrum to GSM operators were allotted as per guidelines, orders and eligibility criteria prevalent on the respective dates of allotment. The Service Licence agreement provides the licensor the right to modify and/ or amend the procedure of allocation of spectrum including quantum of spectrum at any point of time without assigning any reason.*
>
> *The additional spectrum to GSM operators, beyond the initial spectrum had been allotted, as per the guidelines, orders and subscriber based edibility criteria prevalent on the respective dates of allotment. The allotments were made subject to availability of spectrum as well as enabling provision enshrined in the service License Agreement."*

**c)** **In light of the above, the question /issue of charging a one time charge for "additional spectrum" for spectrum above a "committed threshold" does not arise.**

**55. Should the annual spectrum charges be uniform irrespective of quantum of spectrum and technology?**

**a) Yes. We believe that the annual spectrum usage charges should be prescribed at a flat uniform rate irrespective of technology and/or spectrum band deployed.**

b) In this context, it may be noted that the DoT Spectrum Committee (May 2009) has stated in its Report that:

> *"Currently the annual spectrum charge depends not only on the quantum of spectrum but also on technology. These charges are currently based on an escalating percentage of AGR depending on spectrum held. The escalating rate approach is appropriate to discourage substitution of physical infrastructure by spectrum when spectrum is assigned based on administratively determined subscriber thresholds. Once the value is being determined through an auction mechanism, there is no rationale for continuing with an escalating charge approach.*
>
> *There is a second reason why an escalating charge approach is unsuitable when there is an auction. In an auction, the bidder would factor in both the upfront fee payable through the auction as well as the recurring usage charges. If usage charges were to be different at different levels of spectrum holding the entire auction process would be compromised. A person paying a higher usage charge on account of holding a larger block of spectrum prior to the auction would be compelled to place a lower upfront value for the bid and will not have a -level playing field in bidding. Under these circumstances, it would be incorrect to determine the winning bidder only on the basis of the auction price. Therefore, once an auction approach is introduced for spectrum allocation, in order to ensure that all bidders compete and bid on equal terms, spectrum usage charges must be prescribed at a flat / uniform level so as to ensure level playing field in the bidding and allocation of spectrum."*
>
> *"Even though 800 MHz / 900 MHz spectrum has been allocated to operators by the Government for 2G telephony, it is imperative that with the evolution of technology, the same spectrum should be useable for future generation technologies, including 3G and 4G. If that migration happens one cannot have different spectrum usage rates for what was originally GSM or CDMA spectrum..*
>
> *...One can envisage that dual technology operators will have subscribers with dual technology handsets whose calls go through either network - GSM or CDMA. In such cases, it will not be possible to segregate AGR for GSM and CDMA networks for the purpose of calculation of spectrum usage charges...*
>
> *..Different spectrum usage charges have also posed a problem of keeping level playing field in the proposed 3G auction. It was not possible to specify a uniform spectrum usage rate for 3G spectrum alone due to the near-impossibility of segregating 2G and 3G revenues. Therefore operators are required to pay at 3% or their current usage charge rate, whichever is higher.*

*After the 3G auction, then will be four classes of operators: (a) Operators who have only 3G spectrum (b) Operators who have 3G spectrum and CDMA spectrum (c) operators who have 3G spectrum and GSM spectrum (d) operators who have 3G, GSM and CDMA spectrum. As it stands, operators (a) and (b) will pay 3%, operators (c) and (d) will pay either 3% or the rate fixed for their GSM spectrum, whichever is higher. Therefore there will be different usage charges even for the same amount of 3G spectrum. There can be a level playing field only if a uniform rate of spectrum usage is levied to UAS/CMTS licensees irrespective of the quantum of spectrum or, the technology - CDMA /GSM - 2G or, 3G etc…*

*…the Committee recommends that that Government should move to uniform spectrum usage charges, irrespective of quantum of spectrum and irrespective of technology, at the same time as it is moving to a market based mechanism for spectrum assignment and for mergers/transfer of spectrum.."*

**c) We are in agreement with the above views and recommendations of the Committee.**

d) However, as the Authority is aware, spectrum **usage charges are currently being applied on an escalating percentage of AGR depending upon the quantum held be each licensee.** Accordingly, **if spectrum usage charges are made uniform, then all those currently paying higher charges may be given the choice to migrate to the flat charge regime in return for the payment of a one time up front fee. The fee may be charged for the spectrum beyond the allocation at which the rate becomes uniform**.

e) **This issue has been addressed by the DoT Spectrum Committee (May 2009),** which has recommended that UAS/CMTS licensees who have obtained additional 2G spectrum beyond 6.2+6.2 MHz in an LSA prior to 17.1.2008 should be given the option of paying an upfront charge for the spectrum beyond 6.2+6.2 MHz based on the 3G auction price pro-rated per MHz for the remaining period of spectrum assignment from the date when annual spectrum usage rates become uniform or a subsequent date from which they exercise the option. The Committee goes on to state that once this option has been exercised by the Licensee, the annual spectrum usage charges for the spectrum held would become uniform (3% of AGR), instead of the higher rate being levied at present and further that transfer / merger / sharing of spectrum for which such upfront charge is paid will not attract a charge

**f) We are in agreement with the principles and approach that has been advocated by the Committee.**

**g)** It is further submitted that **in the absence of a benchmark market price for 2G spectrum, this one-time up front fee may be benchmarked to the auction price of 3G spectrum. However, this may be reviewed once there is an actual market benchmark available for 2G spectrum.**

**56. Should there be regular review of spectrum charges? If so, at what interval and what should be the methodology?**

a) No. We believe that **while the benchmark/reserve price for the auction may be reviewed from time to time, depending upon market conditions, demand for and supply of spectrum, extent of competition, etc., the annual spectrum usage charges should be stable and predictable over the long term.**

**********

Government of India
Ministry of Communications & I.T.
Department of Telecommunication
(WPC Wing)
6th Floor, Sanchar Bhavan, Ashoka Road, New Delhi-1

No.R-11014/22/2007-NT Dated: 22.08.2008

To,

The Association of Unified Telecom Service Providers of India (AUSPI),
B-601, Gauri Sadan,
5- Hailey Road,
**NEW DELHI-110001.** (Tel.:-23358585, FAX:23327397)

**Subject:-** Mixed band field trial in respect of EVDO and WCDMA in the frequency band 1900-1910/1980/1990 MHz.

Sir,

I am directed to refer to your letter No. AUSPI/13/2007/429 dated 02nd Nov. 2007 and this Ministry's letter No. J-22025/14/06-NT dated 25.09.2007 & 05.10.2007 on the above subject and to state that the report submitted by the Group consisting of representatives from WPC Wing, TRAI and TEC reveals that more observations of the field trial are required to conclude feasibility of the co-existence of 3-G networks of WCDMA & CDMA. A copy of the observations of the Committee is enclosed for perusal and taking necessary action.

In view of above, you are requested to kindly make necessary arrangements for fresh measurements as suggested by the Committee before coordinating spectrum for EVDO as per guidelines of 3-G issued by the Government on 01st August 2008.

Yours faithfully,

(U.S.SIDDIQUI)
Engineer
for Assistant Wireless Adviser
to the Govt. of India
Tele.23036721

Copy to:-

COAI, 14-Bhai Veer Singh Marg, **New Delhi.**
FAX: 23349276/23349277.

S.No. 2(R)

**Report About The Field Trial / Measurement Regarding Co-Existence Of PCS 1900 MHZ CDMA & UMTS 2100 MHZ WCDMA System, Held On 12th & 13th October, 2007 At HYDERABAD.**

The DoT vide its letter No. J-22025/14/06-NT dated 9.10.2007 requested COAI, TRAI & TEC for participation in trial / measurements of co-existence of CDMA & WCDMA systems in above mentioned bands, which was scheduled on 12th & 13th October, 2007 at Hyderabad. The WPC Wing of DoT vide its letter even No. dated 25th September, 2007 & vide letter No. 5th October, 2007 informed nomination of the seven officers and two more officers respectively from COAI. Two officers from WPC Wing were also asked to be associated with the above mentioned trial / measurement. Subsequently, WPC Wing vide its letter even dated No. 11th October, 2007 informed about venue of trial at Hyderabad, details of the testing schedule (as provided by M/s TATA Tele Services on behalf of AUSPI) and tentative time frame (of two days) of testing schedule.

2. For carrying out the trial / measurement M/s TATA Teleservices was granted an experimental licence (under radiating conditions) by the WPC Wing, vide its letter No. J-22025/14/2006-NT dated 4th July, 2007, with the following details:

(i) **Frequency (ies), Power etc**:

| Allotted Frequencies (MHz) | Type of Emission | Maximum Power Output |
|---|---|---|
| 1981.25/1901.25 | 1M25G7W | 20 W |
| 1982.40/1902.40 | 1M25G7W | 20 W |
| 1983.75/1903.75 | 1M25G7W | 20 W |
| 2165.00/1975.00 | 5M00G7W | 20 W |
| 2167.40/1977.40 | 5M00G7W | 20 W |

29/12/07 29/12 29.12.07 29/12

(ii) **Location of the Station / Stations**: Hyderabad. The trial BTSs were installed by AUSPI at following locations:

(a) Panmandi: 14-1-477, Sitarampet, New Agapura, Hyderabad, 17N3824 078E4649

(b) Nampally: AP Lodge, 5-7-545, 456 Dargah Yusufian Lane, Nampally, Hyderabad, 17N3910 078E4656

(c) Mehdipatnam-1: Flat No. 408, House No. 10-3-5/1A, Reliance Kohinoor, Mehdipatnam, Hyderabad, 17N3948 078E4419

(d) Mehdipatnam-2: 12-2-418/B/F, Madina Manzil, Vishwas Nagar, Hyderabad 17N3849 078E4426

(e) Redhills-2: H. No. 10-3-3111/11, Ramananda Niliyam, Castle Hills, Hyderabad 17N3970 078E4498.

(iii) **Purpose**:

(a) Study / trials for simultaneous use (mixed band use) of PCS systems in 1900 MHz band along with UMTS /WCDMA system in 2GHz band with zero guard band and different guard bands, along with requirement of filters with their technical specification.

(b) Trial should be conducted with reasonable number of BTS of both the systems with proper placement to form a cluster along with large number of users /handsets (similar to the situation in a dense traffic area).

(iv) **Conditions** :

(a) On non-interference and non-protection basis.

(b) No claim for regular user / assignment.

(c) In case of interference to existing users, experiment will have to be discontinued immediately.

(d) Other terms and conditions of the WPC letter No. J-22025/14/2006-NT dated 4th July 2007 are also applicable.

3. The following officers attended the field trial ./ measurement at Hyderabad on 12th & 13th October, 2007. No nominee from COAI (out of 9 representatives intimated by WPC) attended the trial.

i. Shri T. K. Varada Krishnan, DWA, RLO, Chennai, **WPC**

ii. Shri A. K. Narula, AWA, **WPC**

iii. Shri Sanjeev Banzal, Joint Advisor, **TRAI**

iv. Rajeshwar Dayal, Director (M-1), **TEC**

4. **Activities and Measurements Carried out during 12th & 13th October, 2007 at Hyderabad.**

(a) The AUSPI had given the presentation on the proposed trial covering the following:-

(i) Trial objective.

(ii) Testing methodology and procedure for co-existence CDMA and UMTS

(iii) Trial network setup along with trial sites details at the following 5 locations in Hyderabad.

(a) Mehdipatnam-I

(b) Panmandi

(c) Muradnagar

(d) Redhills-2

(e) Nampally

b. Subsequently, above mentioned officers have visited the Test Lab at KLK Tower, where network equipments (MSCs / BSCs etc.) of CDMA and WCDMA were placed. The equipments of these two technologies were co-located with a separation of around 1.5 meters. Various components / cards were shown / demonstrated at the site. Both the systems were active. There were also operation & maintenance system for both the systems.

4. The officers then visited Mehdipatnam and Redhills-2 sites, where the antennas of CDMA and WCDMA were mounted on pole. The antennas with horizontal separation of about 5 meters and vertical separation of about one meter were also shown. The BTS equipments of CDMA & WCDMA were placed adjacent to each other in the equipment room.

5. On next day, the AUSPI gave presentation on the findings of various tests conducted by them for the co-existence trials. The copy of presentation is attached at **Annexure A**.

6. The officers, thereafter, visited the Test Lab, where the filter characteristics were demonstrated for WCDMA and CDMA filters at 1977.4 MHz and 1982.4 MHz respectively. It was informed by AUSPI that these tests were conducted in the Test Lab as it was not possible to take the spectrum analyzer at the trial sites since the spectrum analyzer is a very sensitive equipment to be carried at the trial sites. During the Lab test, cable loss and losses of CDMA and WCDMA filters were also measured. The measurement of CDMA/WCDMA filter characteristic and cable loss details are given at **Annexure –B**

7. The officers, then visited the Nampally site, where the WCDMA and CDMA antennas were mounted on the tower. Thereafter, the officers visited Mehdipatnam site where Out Of Band Emission (OOBE) measurements were conducted at the frequency of 1982.4 MHz (of CDMA) and 1977.4 / 1975.0 MHz for WCDMA. The tests results are given as **Annexure C**.

8. Subsequently, the antenna isolation tests were conducted on1982.4 MHz. The test result are given as **Annexure D**.

9. The complete isolation test from CDMA power amplifier to WCDMA Node B based on above measurements is pictorially represented and enclosed at **Annexure E.**

10. Qualitative observations for Interference to voice and data calls of WCDMA (1977.4 MHz) system from CDMA (1982.4 MHz) with CDMA– 'off', CDMA –EVDO 'on' & CDMA- 'loaded (simulated load)' conditions were carried out by making data, video and voice calls. The calls of CDMA were also initiated with WCDMA system active and it was observed that there was no deterioration in data throughput of CDMA. The voice calls from both CDMA and WCDMA mobiles were also made, keeping the two mobiles at a distance about half a meter and no interference was observed. The test result for voice and data performance under various conditions is placed at **Annexure F**.

29/12/07 29/12 29.12.07 29/12

## 5. OBSERVATIONS

a. Measurement / observations were carried out only for co-site located antennae. Therefore, under the given antenna configuration (i.e. co-site), set up by AUSPI, for CDMA and WCDMA systems no interference was observed on 1977.4 MHz (WCDMA) due to transmission on 1982.4MHz (CDMA).

b. However, in a practical scenario, it is possible that WCDMA and CDMA antennas may not always be co-sited. In such a situation any one of the antenna would be in the off-axis angle of another. The interference scenario would then be totally different from what has been demonstrated at Hyderabad. It may be noted that the test schedules and site / antenna configurations are only as set up by AUSPI but same has not been approved by TEC/WPC to evaluate the possible interference scenario. Also the observations were only under almost lab conditions (with only limited number of handsets at specific locations of both the systems operating).

c. It is also observed that the there is a need to have test schedules duly approved to address the above concerns and also the time frame (i.e. 2 days only) was inadequate to thoroughly observe the test equipments set up, site configurations, carrying out the drive tests and analysis of various observations to understand the possible implications of such mixed band operations.

d. Keeping in view the above observations further trial needs to be carried out in other areas / locations before arriving at firm conclusions on the feasibility of co-existence of 3G networks of WCDMA and CDMA with:

i. duly approved test schedules, site and antenna configuration;
ii. distributed BTS antennas (facing each other and in close range) along with co-site locations (looking in same direction);
iii. sufficient time for carrying out detailed measurements.

29/12/07
(Rajeshwar Dayal)
Director, TEC

29/12/07
(T.K Varada Krishnan)
Deputy Wireless Adviser, WPC

29/12/07
(Sanjeev Banzal)
Joint Advisor (MN), TRAI

29.12.07
(A. K. Narula)
Assistant Wireless Adviser, WPC