

To  
The Chairman,TRAI,  
,M.D.BHAVAN,,  
J.L.Marga,NEW DELHI-110002,

Sir,

With reference to above mentioned subject ,we place on record a sincere and meticulous work by OFFICIALS of TRAI on very sensitive but difficult subject of Spectrum.In telecom field and ICT area ,it is at the core of issues and at the mind of every one who deals with RF Spectrum and its various applications.

We are offering our suggestions and comments to the best of our knowledge and judgement on all questions as out lined below :---

(1)	CHAPTER	-1--Q1	TO	Q	6,	
(2)	Chapter	-2---Q	6	TO	Q	44,
(3)	Chapter	-3---Q	45	to	Q	51,

we HAVE TRIED TO UNDER THE ISSUES and offer our suggestions from view point of resolution of various sub-topics.issues and their use in the field by various stake holders.  
With kind regards and greetings ,  
Dr ROOP NARAYAN BHARDWAJ,Executive Director ,TUG INDIA,and  
Consultan,  
Miss Ruchi Bharadwaj,Consultant & Member ,TUG.

## CHAPTER 1.

Ans 1...Kindly refer to sub-para 1.6 and Table 2. THIS TABLE IS BASED ON THE ESTIMATES. WHILE THE FIGURES USED IN mnp consultation paper were based on % of CAGR. This base was further extrapolated on the basis of uniform growth which was not correct step. On the subject of MNP, kindly REFER our submission. The copy of the same was again made available on September 18, 2009 at Inda Habitat Centre in a meeting CAG on customer related issues along with TUG group also.

It is mentioned that in place of 8 years 10 year study period was suggested. The costome numbers extrapolation was based on assumption that in latter part of study, growth was to decline. The latter

Sl No.	years	data	is	reproduced	again:---
Base(in	year	%		CAGR Progressive	Consumer
					million)
1		2014-2015		25	1339
2		2015-2016		25	1674
3		2016-2017		20	2010
4		2017-2018		20	2511
5		2018-2019		10	2652

This is more logical and practical. More over the figures shall be the same in both the studies / consultations.

It is therefore submitted that MNP table shall be used and as proposed by us for 10 years period.

Ans .2...In view of data presented in previous Ans 1, consistency of studies is not there and Credibility of results is also comes under shadow and flavor of transparency is also lost. In addition our comments of para QUESTION 50 may kindly be seen where in it is brought out that SLC criteria in is not absolute and correct. It is one of parameters out of several parameters and there fore can not form the sole base.

Ans 3...The Government requirements in certain cases are important and are of national character and can not come under general public view and consideration.

How ever some of general requirements can be reviewed with the development of new technologies and alternate solutions can be offered. Thus RF Spectrum spared can be used for alternate use. Some services like Radio Networking (RN CHANNELS), DWS, MET SERVICES, ST & F SIGNALS OF NPL, C X S Band for Satellite Mobile applications, special deployments etc are exclusion from the purview of

REGULATOR, THEREFORE NO FURTHER AND SPECIFIC SUGGESTIONS ARE OFFERED.

Ans 4...

Ans 5...Door Darshan being the largest user in addition to some other Govt.PSUs/Departments,the deployment of DIGITAL TV will be sole bases in terms of time frame and use of spectrum by Door Darshan.The balance part can be considered for alternate use termed as Digital Divident.It is safely estimated that 3 to 5 years time frame may be somewhat practical.

ANS 6...7GHz is also in focuss for new evolving technologies like LTE,MOBILE TV and DIGITAL TV and also for Wi MAX..as AND WHEN AVAILABLE CAN ALSO BE CONSIDERD FOR 3 G and BWA .

CHAPTER 2.

Ans 7...Yes.It shall be obtained on the basis of need ,choice of technology options ,roll out pans both in single as well as in multiple service areas.

ANS.08...NO.However SPs and NETWORK OPERATORS may be allowed for the remaining part of the licence period validity.Ar least 3 month ahead of DOE of licence directions shall be issued to such operators and SPs shall also request for extension in similar way

Ans 09...Shall be determined for each service area separately.Kindly also see our comments on Question 50.Beyond SLC,ther are several factors which influence need of spectrum.Thes parameters play key role in estimation of RF SOECTRUM REQUIREMENTS.

Ans 10... Yes.It Will be worth advisable to offer opportunity to more stake holders,SPs and Net WORK OPERATORS FOR MASKING COMPTET ION MORE FIERCE ,FAIR AND STABILISED MARKET.

Ans 11...In case any of the operator has spectrum more than justified requirements,excess spectrum shall be surrendered without Li censor"S interventions.

In case it is is not surrendered market rate shall be used to decide penal rate.It shall be at least 5 times the market rate.This can also be linked up with current equity value as compared to original/face value.

Date; 11 Dec 2009

To

The Chairman  
Telecom Regulatory Authority of India  
Mahnagar Doorsanchar Bhavan  
New Delhi- 100002

Subject: TRAI Consultation Paper on " Overall Spectrum Management and review of License terms and condition"

Dear Sir,

In India traditionally the spectrum management and the licensing related issues were never dealt with long term perspective and this has led to a lot of political and economic maneuvering by the interested parties. We have reached to a situation where it seems to be impossible to get out of the present mess due to legacy issues and vested interest of equipment manufacturers and telecom operators. It is good that the authority is trying to look in to the issue in detail and correct the anomalies.

After going through the response posted on the TRAI website, discussions at he time of open house on 30th Nov, 1st & 2nd December 2009 and earlier submissions make by the same operators in last couple of years to TRAI) we have reached to the conclusion that operators want to grab as much spectrum as possible by hook or by crook with out paying any money and hoard the spectrum to retain their market power. Also to ensure, that new operators do not come in. All these activities have put the subscriber at the receiving end.

We are also seriously concerned about the way the telecom infrastructure is being deployed. There are two serious concerns:

1. As per Vodafone CSR report for global operation the company has used 1.31 million tons of carbon but it does not include Indian operations. Vodafone claims that for India operation alone they have increased carbon foot print to the tune of 1.9 million tons. It is interesting to note that Vodafone had only 17% of Indian market share and that too mostly in urban areas. One can easily estimate the amount of Co2 emissions produced to manage energy requirement for telecom towers.

As per Mr. R.R.N. Prasad Ex member TRAI the present annual requirement of 2.2 billion liters of diesel will increase to 17 billion liters of diesel per year to run telecom towers and this will amount to 600 million tons of carbon footprint per year. The present telecom infrastructure is highly energy inefficient and thus contributes in increasing carbon footage in a phenomenal manner.

2. The operators are allowed to pump maximum 20Watts of EM radiation per carrier per sector from a cell site. The power radiated by telecom towers has increased in such a phenomenal manner that it has become highly dangerous for the persons living with in a radius of 400-600 meters of a cell tower. The operators and telecom equipment manufacturers do negate this problem on the basis of sponsored research conducted in

highly engineered environment that states that we could not establish any adverse impact from the amount of electromagnetic radiation received from such towers. One may easily calculate the power density on such dangerous electromagnetic radiations and verify by taking actual measurement in the field. As a matter of fact in BCD each tower hosts 3-5 operators and each operator use 5-7 carriers in each sector.

More over, in practice, in order to get better coverage these operators pumps 60-80 watts of energy per carrier per sector. The studies indicate that due to such high intensity of electromagnetic radiations the soft membrane of eggs of sparrows and crows fractures and thus never hatch. You may easily observe disappearance of sparrows and crows in urban areas due to this uncontrolled electromagnetic radiation. Another study predicts that the honey bees will disappear by 2020 as they loose their navigational sense in high intensity electromagnetic field. Some of the researchers have demonstrated that these high energy microwave radiation have serious ill effects on the human beings.

If the telecom systems are deployed in a bit different scientific manner we may take care of Co2 emission, avoid impact of excessive electromagnetic radiations. Further, such deployments will reduce the load on spectrum to the tune of 60%. To achieve such objectives Ofcom had made available 3 MHz of GSM spectrum for low power in building use (many European countries has made 2 to 3MHz GSM spectrum available for in building use). The street furniture such as lamp posts is used for providing coverage on the roads and adjoining areas. Such low power distributed telecom system reduces the load on spectrum requirement dramatically and protects from the ill effect of electromagnetic radiation and carbon footprint.

Hence, in our view there is no scarcity of the spectrum even in CBD. The operators must be in a position to provide excellent quality of service with the existing quantum of contracted spectrum (6.2 MHz for GSM and 5 MHz for CDMA). The authority must recommend the Government to make 3MHz GSM spectrum for low power in building solution and mandate the use of street furniture for coverage outside the high-rise buildings. The electronic systems for on line continuous monitoring of parameter such as electromagnetic power density, electric energy consumed from the grid and DG sets etc may be deployed at each tower for strict monitoring to protect the environment and efficient use of spectrum. If Government implements the following scheme the existing anomalies and be resolved in the interest of the subscriber and the healthy growth of the sector:

Spectrum is a national resource. Government only provides right to use to the operator to use the spectrum at a license fee and royalty. It is not a matter of right of the operators as they operate under the license of the Government. As such spectrum trading is out of question.

The spectrum has commercial value and the enterprises must pay this commercial value for right to use. Giving spectrum at notional cost amount to cross subsidizing the elite at the cost of poor. It is interesting to note from the balance sheet of the operators the

operators have minted the money by getting allocated spectrum illegally ( the EBDTA of Bharti had increased from 24% to 44% and there is no other sector that operators on such high margins using public asset free) and we the consumers/the poor citizens remained at the receiving end to pay for telecom operators growth. There is an urgent need to bring total transparency in the operations of all telecom operators. We very strongly feel that the Commercial Cost Spectrum cost has to be determined and administered by the Government.

In order to get optimum use of spectrum and to provide cost effective and state of the art service to the subscribers it is necessary to only contracted quantum of spectrum only i.e. 5MHz and 6.2 MHz to CDMA and GSM operators. Any operator willing to get more than this quantum of spectrum must pay additional yearly spectrum license fee and royalty as per following formula:

6.2 MHz or 5 MHz for GSM and CDMA operators as per initial contract.

For each MHz of spectrum beyond the above contracted quantum, a yearly license fee and additional royalty must be paid, in each service area, in the following increasing order:

500, 450 and 400 crores for 8 MHz to 9 MHz in A, B and C circles respectively & 2% Revenue share/Mhz over & above 6.2 Mhz, in addition to the existing Revenue shares.

TRAI may define different annual fee for different band of spectrum to make sure that that the operators must consider to spend more on CAPEX or on recurring OPEX.

The spectrum allocation to each operator with respect to efficient utilization, commercial value etc should be reviewed periodically.

Operators should be free to use any spectrum efficient technology, 2G, 3G, 4G, LTE, broad band etc and acquire spectrum from Govt (no trading allowed) only. They may return the spectrum to the central pool if they do not require.

The spectrum must be given for use for a period of five year only for a particular emission and sensitivity level, and then it would be reviewed. This will allow using the spectrum for other efficient technologies that may work below the floor level noise.

Even after merger and acquisition the above formula would apply.

3 MHz spectrum in 1800 Mhz, to be made free for in building use. This will reduce the load on spectrum requirement.

Government must formulate policy to facilitate use of street furniture.

The operators must pay for the additional spectrum they have acquired beyond the contracted quantum of 6.2 and 5 MHz based on the above formula with prospective effect & not from retrospective effect.

USO fund should not support any scheme that increases carbon footprint and produces excessive electromagnetic radiations and thus may disturb ecological balance in rural areas.

TRAI must work out the formula in such a way that operators may not be in a position to take shelter of the court to delay the process of reform.

We are confident that the present authority will take necessary actions in the interest of the consumers, involve us in correcting the anomalies in the telecom sector in the interest of the telecom sector and the nation.

We will be too pleased to provide further inputs, if required.

Thanking you

Yours sincerely.

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