CONSULTATION PAPER ON SPECTRUM RELATED ISSUES

INTRODUCTION

In reply to request from TRAI for inputs from various Telecom Operators and Service providers in framing a spectrum allocation policy and related issues, VSNL hereby submits the inputs.

ISSUES FOR CONSULTATION

CHAPTER- II
CURRENT SPECTRUM AVAILABILITY AND REQUIREMENT.

ISSUE-I Should the 450 Mhz or any other band be utilised particularly to meet the spectrum requirement of service providers using CDMA technology?

VSNL Reply: The band of frequency of interest for the mobile operators does not match or clash with the frequencies of interest for VSNL which are listed in following Table-I. and Table-II attached herewith. Hence VSNL do not want to comment on this issue.

ISSUE- II. The consultation paper has discussed ITU method for assessment of spectrum requirement. Based upon the methodology, submit your requirement of spectrum for next 5 years. While calculating the required spectrum, please give various assumptions and its basis.
VSNL Reply: VSNL is operating radio links for following types of services.

i) Terrestrial Radio links / Satellite links used in long distance operators including NLD,ILD TV Uplinking.
ii) ISP last mile services.
iii) In-marsat service.
iv) GMPCS service such as ICO and Iridium.

The frequencies used and likely to be used by VSNL against each of above service is an in attached Table-I and Table-II respectively.

Frequency availability: At present the frequency in the protected bands for MMDS services are much in demand in the frequency bands of last mile radios such as 2.7 to 2.9, 3.3 to 3.4.. According to the recent report of NFAP- WG-III , the band of 5.1 to 5.7 is being opened up as follows:
Band of 5150-5250 MHz & 5250-5350 MHz for indoor RLAN purpose only. Band of 5470-5725 MHz is opened up for indoor and outdoor Wireless Access Services. This needs to be clarified by WPC whether MMDS service also will be allowed in the 5.47 to 5.725 Ghz band.
Frequency Requirement: There is a good demand for more frequency allocation in the MMDS or last mile usage. Already the 2.7 to 2.9 Ghz band is getting congested. The

allocation of 3.3 to 3.4 and in 5.4 to 5.7 Ghz (and other bands such as 4.9 Ghz if possible) for MMDS/Broadband usage should be expedited. Also the bands for LMDS such as 10.5 Ghz should be allowed to be shared for MMDS also, as both are similar networks serving similar purposes, which require protected bandwidth. VSNL will be requiring 40 to 45 Mhz of spectrum in above band in the immediate future for the MMDS network across the country.

ISSUE-III: NO COMMENT.

ISSUE-IV: NO COMMENT.

ISSUE-V: RE-organisation of spot frequencies allotted to various service providers & for efficient utilisation of spectrum. Please suggest the ways and means to achieve it.
VSNL REPLY: Generally once frequency is allotted and networks are established, it is economically unfeasible to migrate to different frequency band. Such migrations are done rarely based on international co-ordination commitments and unavoidable reasons. Also they should be based on consensus approach. Replacement of equipment or network should be forced only in such cases wherein the new network is established or expanded by the operator after such notification of migration. Then also operator to be allowed at least one year margin to migrate

ISSUE-VI: NO COMMENT.

CHAPTER-3:
TECHNICAL EFFICIENCY OF SPECTRUM UTILISATION.

ISSUE-VII: Please offer comments on the methodology outlined in this chapter for determining the efficient utilisation of spectrum. Also provide your comments if any on the assumptions made.
VSNL REPLY: The methodology, spectrum and contents of this chapter are totally on mobile technologies based on GSM/CDMA. Thus VSNL has no comments.

ISSUE-VIII. No Comments.

CHAPTER-4: SPECTRUM PRICING.

ISSUE-IX: Is there a necessity to change from the existing revenue share method for determining the annual spectrum charge ?
VSNL Reply: VSNL does not have any radio network that is charged based on revenue share basis. But with ref to VSNL's networks, we would like to strongly convey our request for change in the spectrum pricing.

ISSUE-X: What methodology should be used for spectrum pricing?
VSNL Reply: Though VSNL has no comments on Table in Section 4.8; VSNL would suggest changes with respect to networks used by VSNL in a detailed manner in following replies.

X.a) The royalty for Point to Multi-Point network should be based on consideration that as a single network in the range of a city. Thus if PMP operator takes license for one frequency slot in a city, then the same royalty should cover entire city. The concept of number of base stations in royalty should not be followed for this purpose due to reason that single base station coverage is normally limited to only 5-10 km radius which is low in proportion of a city's dimensions.

The above suggestion is also justified due to fact that PMP networks are used for ISP industry, which is a highly elastic market. It requires these concessions in order to meet the growing demand. Also it is required for purpose of universal spread of network by overcoming last mile problems faced in areas of city where fiber rollout is not yet established and in development stage.

X.b) The royalty tariffs for VSAT networks used for voice as well as data traffic, should be on the basis of network. The present policy on VSAT allow for sharing of same frequency by multiple terminals and the spectrum fee will be charged only once for the network and does not depend on number of terminals. This is the right policy and should continue.

X.c.i) FSS Service: Large Satellite antennas (of solid dish) such as 18 metres Standard 'A' antenna or 13 metre Standard B antenna, has very narrow beam-width i.e. only 0.1 deg or 0.2 deg. The beam-width of smaller antenna such as 1.2 mtr antenna will be 1.45 deg. We can easily compare this with terrestrial link radios, which have large beam-width of 8 deg or 15 deg or 45 to 360 deg. Also elevation angles are high for looking at geo-stationary satellites. Thus satellite antennas occupy much lesser air space allowing multiple antennas to co-exist and it cannot cause any interference to nearby networks. Thus there should be good incentive to satellite antennas.

We would request for following concessions in order to make it more economically sustainable. Other countries allow highly simple and liberalized structure on procedures.

x.c.ii) Operating Frequency flexibility: Satellite earth stations are required to change carrier frequency at short notice due to transponder balancing by Satellite owner such as INTELSAT. Typically few minutes or few hours of advance notice is given for such exercise. Whereas existing WPC regulations do not allow such flexibility and requires prior licensing and clearance from local regulator in which case the timeline is unfeasible. In order to facilitate hassle free regulations wrt satellite operations, it is suggested to change over from the bandwidth based royalty charge to the fixed royalty charge. In this case the royalty will be fixed on per active earth station basis as followed in other countries. In this scheme the spectrum charges are fixed and does not depend on actual spectrum used. We would suggest that this fixed royalty for satellite antennas should be typically 1/10th of royalty for terrestrial network due to the justification that beam-width is typically 1/10 or even 1/100h of terrestrial networks. Also frequency allocation for earth station should be brought under fast track category.

Example: Srilanka charges Rs 3 Lakhs SLR per year as fixed royalty charge per active earth station.

An additional commercial justification : Already satellite communication industry is very much on under regression due to cheap fiber connectivity charges. The imposition of such tariffs and procedures cause slackening or even sickness of the satellite communications industry

X.D) Ku Band Frequency networks (in 11 Ghz-14 Ghz) are generally used less due to the rains fading. Thus these networks do not provide the standard uptimes as other networks and thus these frequencies are more easily available. Royalty for these frequencies can be discounted by half of the other frequency royalties.. This to be applied for both satellite as well as terrestrial radio links.

ISSUE XI: In the event AIP is adopted as means to spectrum pricing, would it be fair to choose GSM as a reference for determining spectrum price?
VSNL Reply: GSM pricing should not be adopted for non-mobile spectrum range.

ISSUE XII: No comments.

ISSUE XIII: In case auction methodology is used… pls give suggestions…
VSNL Reply: Auction method will result in monopolisation, as only large groups with good financial base will get the spectrum. Being a natural resource, spectrum should be allowed for smaller operators also. Thus spectrum can be best allotted based on equitable manner and with a limit on total bandwidth for each operator.

ISSUE XIV: Should the new pricing methodology, if adopted be applicable for the entire spectrum or should we continue with revenue share…?
VSNL Reply: Spectrum for mass usage such as GSM/CDMA bands can be allotted on different manner compared to spectrum for newer technologies such as Wimax or MMDS/LMDS. VSNL's suggestion on methodology is covered by another para/reply.

ISSUE XV: What incentives be introduced thru pricing to encourage rural coverage…?
VSNL Reply: Rural coverage can be defined based on population of the nearest town in order to encourage rural deployment.. Royalty for rural areas can be charged much lower in order to achieve economic feasibility.

ISSUE XVI: Does M x C x W formula for fixed wireless spectrum pricing needs a revision? If so suggest the values for M,C,W.
VSNL Reply: Yes. MCW formula needs revision. Detailed suggestions are as follows:

<u>XVI.i). Royalty Weighing Factor for Bandwidth:</u> The frequency band factor (or weighting factor) is at present classified on slabs namely 0 to 2,2 to 7,7 to 28 Mhz and > 28 Mhz. The slab of 7 to 28 Mhz is wide and it can be divided into two slabs and in effect the W factor can be specified for various bandwidths as such as follows:

0 to 2 Mhz W = 30.
2 to 7 Mhz W = 60
7 to 14 Mhz - W = 90
and 14 to 28 Mhz. – W = 120.

XVI.2 Frequency Band Factor (Multiplication Factor) in the Royalty charges: At present M factor is based on the distance such as 0-5, 5–25,25–60 km…It needs to be rationalized and broken down into further sub-slabs with different M factors as follows:

0 to 5 km, M = 1200.
5 to 10 km, M = 1800
10 to 25 km, M = 2400
25 to 40 km, M = 3600
40 to 60 km, M = 4800
60 to 120 km, M = 9000
120 to 500 km, M = 15000
.> 500 Km, M = 20000.

ISSUE XVII: Should there be different pricing levels for shared spectrum versus spectrum that is allocated with protection?..
VSNL Reply.: Yes. At present the 2.4 Ghz band is allowed as free band for indoor use. The 2.4 Ghz band (and the 5.7 Ghz band recently declared) is the shared band and are declared as non-interfering and non-protected band. Thus these bands should not be charged for the spectrum fee. This is in line with the international practice where these bands are free for outdoor use also (including public land/areas). The power and data limits currently in practice i.e. 64 Kbps can also be specified.
The royalty rates for all other spectrum bands can be charged based on suggested changes in Reply XVI.

Chapter-5: SPECTRUM ALLOCATION

Issue XVIII: How much minimum spectrum should each existing operator be provided? (Refer section 5.4)
VSNL Reply: Spectrum band in demand may be allocated based on Approach 1 wherein it can rely on market dynamics, (i.e. taking note of evolvement of technology and based on available best spectral-efficient equipments). Level playing field for all players in order to meet their license commitments.

ISSUE XIX: No comments.

ISSUE XX: Should spectrum be allocated in a service and technology neutral manner?
VSNL Reply: No. Allocation can be made depending on type of service and based on spectral efficiency of the equipment.

ISSUE XXI: What should be amount of cap on spectrum assigned..
VSNL Reply: Amount of spectrum cap can vary with different bands and services. Spectrum allocated should be sufficient to meet customer demands and can be decided based on most spectral efficient network's spectral requirement to meet demand.

There should not be any spectrum cap on satellite networks due to reason that satellite frequencies are internationally coordinated and there is no need for local regulator's intervention.

ISSUE XXII: What procedure for spectrum allocation be adopted for areas where there

is scarcity and in areas where there is no scarcity?
VSNL Reply: Scarcity can be first defined based on following process:
Step1: Whether all operators are using spectral efficient networks? If not, then cap allocation to them. Distribute remaining spectrum to others.
Step2: If operators have applied for multiple frequency slots for same/similar purpose, total allocation can be basis for allocation.
Step-3: After above there is still scarcity, then based on Approach 1 in section 5.4 and suggestion as in X.VIII, spectrum can be allocated.

Where there is no scarcity, spectrum should still not be wasted on very low efficiency

ISSUE XXIII: Which competitive spectrum allocation procedure be adopted in cases where there is scarcity?
VSNL Reply: Beauty Contest (i.e. based on best technology which gives a high spectrum efficiency) be adopted for allocation.

ISSUE XXIV: No comment.

ISSUE XXV: No Comments

ISSUE XXVI: No comment.

CHAPTER-6:

RE-FARMING.

ISSUE XXVII: No comment

ISSUE XXVIII: What approach should be adopted for re-farming of spectrum after expiry of license?
VSNL Reply: As first step if the operators wants to continue using the license, he can be given extension provided his spectral efficiency is not too low compared to current technologies. If he does not want to continue then it can be allocated as mentioned in Approach-1 in section 5.4 and based on scarcity situation explained in Issue XXII.

SPECTRUM SURRENDER

ISSUE XXIX: Should there be any refund for spectrum surrender in principle?
VSNL Reply: Yes. There should be refund for spectrum surrender in principle.

ISSUE: XXX: Should there be refund for spectrum surrender subsequent to Unified Access license policy? If yes, what should be the basis?
VSNL Reply: Yes. Even after Unified Access license policy, refund should continue. The basis can be amended as suggested below.

As a first step, there should be clear well-defined spectrum surrender policy and procedure. Ambiguities in current surrender policy cause much financial loss to the

operator.

Mid-year closure of links:

At present the royalty of links closed in mid-year are adjusted for the closed period on quarterly basis during the next year renewal and it is based on date of intimation to WPC. But this process of adjustment needs to be streamlined. The advance date for such closure is not specified as at present. In order to remove this ambiguity, exact cut-off date for such advance intimation needs to be notified and it can be 15 days before end of the calendar month.

Also it is recommended to convert from quarterly accounting to monthly accounting due to fact that many of the current business practice are based on monthly billing.

Linkage with Non-Dealership Possession License (NDPL).

At present link closures are related to the NDPL, and this is causing much administrative hassles and losses in ownership and maintenance of all types of radio networks.

Operators are advised to take NDPL license or permission from WPC office, every time spare radio equipment is moved out of place. Documents related to purchase of the radio equipments such as purchase order, invoice, make etc are being demanded from telecom operators. This process is acceptable during import of equipments as all these documents will be available during import and will be easy to correlate the set of equipment with their documents. But typically once these equipments are put to use, during operational contingencies/ failures, spares or sub-parts of the equipments are to be interchanged between various stations anywhere in the country. Due to costly nature of these radio equipments operators cannot afford to stock complete units as spares in each station.

Such stringent NDPL regulations make the entire ownership and management of radio equipment a highly uneconomical activity. Thus the NDPL regulations needs to be liberalized by means of dispensing the licensing method for every movement of spares and units and by means of introducing self-declaration procedure for spare radio equipment for each operator. Generally inspections can be done in order to identify violators.

It is also suggested to avoid linking of royalty adjustments with NDPL and related problems.

ISSUE XXXI: How should the amount of refund be estimated?

VSNL Reply: As explained in Reply-XXX, it can be on monthly basis and based on actual date of intimation of surrender and the cut-off date for such intimation. .

SPECTRUM TRADING

ISSUE XXXII: Should we open up the spectrum market for spectrum trading? If yes, what should be the time frame for doing so?

VSNL Reply: Yes. But Spectrum Trading can be opened up conditionally as explained below under Issue XXXIII. Time frame can be along with Unified licensing.

ISSUE XXXIII: What are the pre-requisites to adopting spectrum trading?
VSNL Reply: Spectrum trading can be opened up conditionally. The spectrum allocation should be based on spectral efficiency of network proposed and based on scarcity as already suggested in 5.4 and Issue XX & XXII. Un –conditional spectrum trading may result in in-efficient spectral usage.

MERGERS AND ACQUISITIONS

ISSUE XXXIV: Whether we should specify a cap higher than 2x15 Mhz for Metros and 2x 12.4 Mhz for Cat-B & C areas in case M&As.?
VSNL Reply: VSNL hereby comments only on frequency of VSNL's interest. Thus we recommend increase of cap to 40 to 45 Mhz in each service specific freq bands (except satellite bands) are used and for Metros and non-metro cities as well.

ISSUE XXXV: In case IMT2000 is considered as a continuum of 2G services, is there a need to have a cap higher than that without IMT2000? Should there be individual caps on 2G & 3G spectrums or a combined cap?
VSNL Reply: No comment on first question. There can be combined cap on 2G & 3G spectrum due to reason that later generation network will replace previous generation networks.

ISSUE XXXVI: In case of M&As where the merged entity gets spectrum exceeding the spectrum cap, what should be the time frame in which the service provider be required to surrender the additional spectrum?
VSNL Reply: The operator to be notified on such excess allocation and he should be advised to surrender in one year's time. This time frame is essential in order for him to re-locate/re-organise the network equipment.

SUPPLEMENTARY ISSUE

One important procedural issue that affect smooth functioning of the spectrum management is not mentioned in the consultation paper. VSNL hereby raises this as a Supplementary issue related to Spectrum issues:

Raising demand notes by WPC for License Renewal.

In the present practice of WPC license renewal, following problems are faced:
i) There is no practice of raising demand notes on any operator indicating royalty to be paid during renewals. As a result, the operator makes payment for renewal based on his own calculations.
ii) There is no confirmation on amount to be paid based on current information with WPC.
iii) There is no confirmation on payment received by WPC (by means of receipt).
iv) License renewals are not being settled in timely manner.
v) For purpose of NDPL issue/renewal, the local WMO office demands WPC license copy, which links them with specific link license.

vi) End customer wants a proof that the wireless link is licensed and wants a WPC authentication by means of sealed copy where in the specific link is mentioned. But WPC issues license renewals just by one page letter, which states only the license number, and it does not mention any details on which links are renewed or royalty paid.

WPC should adopt minimum standard practice of issue of Demand notes. The demand can be based on the existing known links active and closed status. The practice of demand note is well established in other wings of DOT and it is suggested that it be followed by WPC also.

a) At end of year, operator will provide details of link closures and links that need to be renewed.
b) WPC will issue demand note to that operator in order to renew the license.
c) Operator will make payment.
d) WPC to acknowledge and issue receipt against the total payment.
e) On conciliation of link wise payment, WPC will renew license in a notified time frame. The renewal or license should be signed or stamped in each page wherein specific link details are provided in order to confirm this as proof to the end customers.

Thank you

TABLE-1

TABLE OF FREQUENCIES USED BY VSNL

S.No	TYPE OF SERVICE (as used by VSNL)	FREQUENCY RANGE AS IN NFAP. (GHZ) (Precise freq used by VSNL in brackets)	USED AT PLACE
1	Fixed- Satellite Incl Intelsat and In-marsat (Earth to Space)	5.85 to 6.7 (fully used)	All over India
2	Fixed- Satellite Incl In-marsat (Space to Earth)	3.4 to 4.2 (fully used)	All over India
3	Fixed- Satellite (Space to Earth)	10.7 to 11.7 (10.7 – 11.7)	All over India
4	Fixed- Satellite (Space to Earth)	11.7 – 12.75	All over India
5	Fixed- Satellite (Earth to Space)	12.75 - 13.25 13.75 - 14.25 (14-14.25) 14.25 - 14.8	All over India
6.a	Mobile-Satellite (Space to Earth) (Inmar-sat Terminals.)	1.525 - 1.559 (1.53445 – 1.534455 & 1.538975 – 1.539025)	All over India
6.b	Mobile-Satellite (Space to Earth (INMAR-SAT LES)	1.525-1.559 (1.534 – 1.539)	Arvi
7	Mobile-Satellite (Earth to Space) (INMAR-SAT Terminals)	1.61 - 1.66 (1.627-1.65)	Terminals All over India & Earth Station in Arvi.
8	Fixed (MW LINK)	1.71 to 2.29 (1.912-2.261)	Mumbai
9	Fixed. (MW LINK)	7.3 – 7.750 (7.428 – 7.694)	Mumbai-Arvi-Pune
10	Fixed (MW LINK)	7.550 – 8.4 (7.750-8.25)	Chennai
11	Fixed (MW LINK)	7.550- 8.4 (7.734.7.91 & 8.046-8.22)	Kolkata.

S.No	TYPE OF SERVICE (as used by VSNL)	FREQUENCY RANGE. (GHZ) (actual used in brackets)	USED AT PLACE
13	Fixed (PP & PMP)	5.725-5.850 (5.7275 – 5.8475)	Delhi, Mumbai,Chennai,
13	Fixed (PP & PMP)	2.300-2.4835 (2.404 – 2.482)	Delhi, Mumbai, Pune,Dehradun, Kolkata, Mohali(Chandigarh)
14	Fixed (PP)	2.300-2.4835 (2.311-2.482)	Chennai, Coimbatore
15	Fixed (PP)	2.469-2.480	Pondicherry
16	Fixed (PP)	2.4 – 2.442	Hyderabad
17	Fixed (PP	2.29-2.31 2.422 – 2.433 2.466.9 - 2.472	Bangalore
18	Fixed (PMP)	2.36 – 2.368 2.454 – 2.462 2.339-2.347 2.433 – 2. 441	Ernakulam
19	Fixed (PP)	2.441 – 2.446 2465 - 2490	Kanpur
20	Fixed (PMP)	1.429-1.492 (1.4325 – 1.44 1.481-1.49)	Chennai, Kolkata

TABLE-II

TABLE OF FREQUENCIES LIKELY TO BE USED BY VSNL

S.No	TYPE OF SERVICE (Precise name of service)	FREQUENCY RANGE AS IN NFAP. (GHZ)	USED AT PLACE
1	GMPCS (Iridium Hub– UPLINK)	29.1 to 29.29 Ghz	At Pune.
2	GMPCS (Iridium Hub – DOWNLINK)	19.41 to 19.59 Ghz	At Pune.
3	IRIDIUM Terminals	1.616 to 1.626.5 Ghz.	Terminals.
4	GMPCS (ICO Hub- UPLINK)	5.175 to 5.2445 Ghz	At Chattarpur, Delhi.
5	GMPCS (ICO Hub- DOWNLINK)	7.011 to 7.0739 Ghz	At Chattarpur, Delhi.
6	GMPCS (ICO- TERMINALS- UPLINK)	1.985 to 2.015 Ghz	All over India
7	GMPCS (ICO- TERMINALS DOWNLINK)	2.17 to 2.2 Ghz.	All over India