

Response to the Consultation Paper on “Delivering Broadband Quickly”

Consultation Paper no. 12/2014

Zee Network



Contact Persons:

Amitabh Kumar- amitabh.kumar@zee.esselgroup.com

A.Mohan - avnindra.mohan@zee.esselgroup.com

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1. Introductory comments

The Zee Network having gone through the Consultation paper on “Delivering Broadband Quickly” (Consultation Paper no. 12/2014) would like to provide its comments.

However at the outset we are pained to note that the consultation paper has not recognized the role which DTH and cable services have been playing worldwide in successful delivery of Broadband services. We are pained to find that the consultation paper has hastily come to the conclusion that cable (Including FTTH) services are likely to be too expensive and the only way-ahead for a quick introduction of broadband services seems to be to grant additional spectrum bands for IMT services (mobile broadband). This includes the giving away of important bands such as 3400-3600 MHz which is today used by dozens of satellites for Extended C-Band services including Data and VSATs, the 700 MHz band which is intended to be used for terrestrial Broadcast services.

We regret to note that the consultation paper is lacking in any analysis or consideration of Spot beam Ka-Band satellites which can deliver hundreds of Gbps across a vast country such as India which is characterized by a large number of rural towns which are yet to be connected by Fiber optic cable.

We also note that the consultation paper does not address the regulatory position on License conditions of DTH, MSOs or Cable operators in their ability to provide Broadband services. For DTH operators which today reach over 50 million homes in India, it is feasible to provide broadband internet in the Ku or Ka-band on the same satellite. However the same is not permitted by the License conditions.

We do not find that the questions have been framed appropriately to address any of these issues. Hence we do believe that after receiving and reviewing responses the consultation paper should be reviewed and reissued to include the role which the Cable and satellite industry can play in providing broadband internet to the vast and far-flung areas of India (including Village panchayats), subject to suitable regulations enabling and empowering the DTH & Cable services.

In fact we are painted to note that while the 3G and 4G spectrum lies unutilized to the extent of 80-90%, there is an effort by some operators to seek spectrum in bands such as 700 Mhz in order to avoid meeting their rollout commitments. The Broadband Spectrum in 2.3 GHz which was auctioned for WiMAX Broadband services 4 years back lies unutilized even as the operators are eying alternate bands.

We do not believe that the objectives of the “Quick Broadband Penetration in India” will be met while the TRAI and the Ministry of Communications and IT permit the operators who have won spectrum auctions for wireless broadband, 4G and 3G, indulge in dilatory tactics in order to gain access to bands which are cheaper to implement while at the same time seeking to disrupt existing services of Satellite (3400-3600 MHz) and terrestrial Broadcasting (700 MHz Band). Not only are the dilatory tactics in play, but the broadband WiMAX spectrum end use is planned to be changed to include voice services for which special permission has been given to one operator.

This band, where spectrum charges have been notified at the lower range of 1% to promote broadband services using WiMAX, is now therefore planned to be used for 4g-LTE voice services creating an uneven playing ground amongst voice operators which use 2G and 3G where spectrum usage charges are higher.

But more serious than this anomaly and market distortion is the fact that the broadband spectrum of 20 MHz across India will not be used for WiMAX broadband but for voice, depriving the country of the opportunity of quickly rolling out the Broadband services.

This coupled with the fact that the role of satellites with Ka-Band and spot beams has not been recognized in the consultation paper make it a fit case for a complete review and reissue rather than permitting it(the consultation process) to be used for the benefit of one faction of mobile operators to gain additional spectrum.

Zee would like to submit its comments to some of the specific issues, as we believe that the set of questions posed in the consultation paper (CP) do not address all options and are directional towards a set of recommendations.

Response of Zee Network to Specific Questions

Q1. What immediate measures are required to promote wireline technologies in access networks? What is the cost per line for various wireline technologies and how can this cost be minimized? Please reply separately for each technology.

Q2. What are the impediments to the deployment of wireless technologies in the access network? How can these deployments be made faster? Please reply separately for each technology.

The Zee Network would like to take reference to Paras 2.39 and 2.40(Mobile WiMAX). We note that the Authority has come to the conclusion that “Mobile WiMAX takes the fixed wireless application a step further and enables cell phone-like applications on a much larger scale...it offers superior building penetration and improved security measures over fixed WiMAX. Mobile WiMAX will be very valuable for emerging services..”

We would convey our agreement with these conclusions. In addition we suggest that the operators who have won auctions of **Mobile broadband spectrum which was meant for the deployment of Mobile WiMAX be not permitted to change end use to Voice using 4G-LTE.**

Referring to Para 2.41 (satellites), we note that only a passing reference has been made of the capability of satellites. The concluding remarks include the following:

“However, the high cost of providing broadband over satellite indicates that it is not a viable business case and needs to be subsidized. Suitable incentive schemes need to be worked out so that broadband can be provided in rural, remote and far flung areas. USO fund may be utilised to provide subsidy for provisioning of broadband services through satellite in remote and hilly areas.”

We would like to draw the attention of the Authority in this regard to the new generation of Ka-band satellites which, as is widely known use Ka-band technology, sometimes in conjunction with other bands such as ku.

While Ka_band platforms such have been used in conjunction with DTH service Direct TV and Dish Network, and other platforms such as Spaceway - Wildblue are serving communities in USA, is instructive to note the use of a number of Ka-band satellites for this purpose:

Indicative List of Launched Commercial Satellites With Ka-band	
Company	Satellite System
Arabsat	Arabsat-5B, Arabsat 5C
Avanti	HYLAS-1 / HYLAS-2
Eutelsat	Eutelsat-W3 series, Ka-Sat , Hotbird
Hispasat	Spainsat, Hispasat-1E
Hughes	Spaceway-3 / Jupiter-1
Intelsat	IAS-28 / Intelsat-20
Ipstar	Ipstar
Iridium	Iridium (LEO)
JAXA/NICT	Winds
Nilesat	Nilesat 201
SES	ASTRA 1H, ASTRA-1L, ASTRA-3B, ASTRA 4A, AMC-15, AMC-16, NSS-6
Spacecom	Amos 3
Telesat Canada	Nimiq 4
ViaSat	ViaSat-1 , Wildblue -1 , Anik-F2
Yahsat	Yahsat 1A (government) / Yahsat-1B

Indicative List of Planned Commercial Satellites With Ka-band	
Company	Satellite System
ABS	ABS-7, ABS-2
Arabsat	BADR 7
Avanti	HYLAS-3
Eutelsat	W3C, EUTELSAT-3B
Eutelsat / ictQATAR	ES'HAIL
Hispasat	Hispasat AG1, Amazonas-3
Inmarsat	Global Xpress F1/F2/F3
Inmarsat	Alphasat 1-XL
ISRO	G-Sat 14
Measat	Measat -5
NBN Co	NBN-1 / NBN-2
NewSat	Jabiru 1
O3B Networks Limited	O3b Networks (MEO)
RSCC	Express AM5 & AM6 & AM7
SES	Astra 2E, ASTRA 2F, ASTRA 2G, ASTRA 4B, ASTRA 5B
Russia RTCom	National Systems
Spacecom	Amos 4 & 6
Telenor	Thor-7
Turksat	Turksat 4A / Turksat 4B

The Satellites Hylas 1,2 and 3 are serving Africa and ME, while the Jaibaru platforms would support the Ka-Band broadband for MENA(Jaibaru-1), Australia-Asia(Jaibaru-2) etc. There are numerous such examples and we have selected only some to highlight that the situation in rural India is similar to Africa, Middle-East and Australia and similar solutions would work very well.



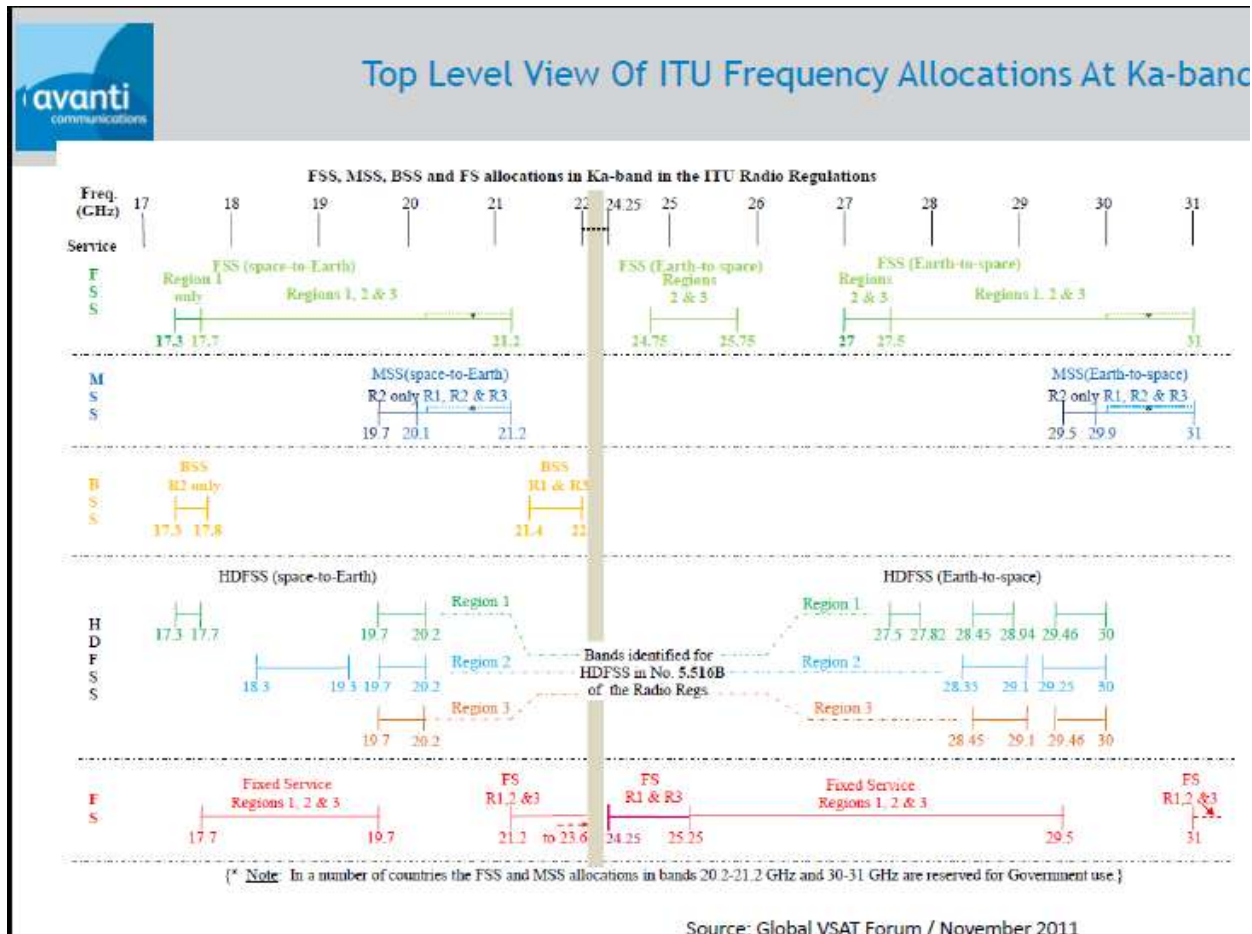
The use of such bands and satellites requires that suitable regulations be put in place. At present the customer terminals are treated as VSATs and permitted to operate in only specific bands permitted & allocated by ISRO. Enabling the use of broadband Ka would require regulatory permissions to be put in place whereby the existing operators can offer these services under their license. Specifically:

- 1).Ensure Ka-band FSS satellite frequency allocations of the ITU are implemented in national frequency allocations tables.
- 2).Ensure equitable market access for Ka-band GEO Systems and extension of DTH licenses to include broadband.
- 3).Ensure licensing policies established to enable Ka-band GEO FSS satellite service provision and Ka-band GEO FSS VSAT network operations in country.
- 4).Transparent, efficient and fair licensing regime to meet needs of operations, service providers and consumers / customers for GEO Ka-band FSS satellite services.
- 5).Implement a Ka-band VSAT **Blanket License approach** for GEO Ka-band VSATs (so end users do not need to apply for individual licences).
- 6). **Implement a transparent and fair spectrum / licence fee for GEO Ka-band VSAT network operations / service providers.**

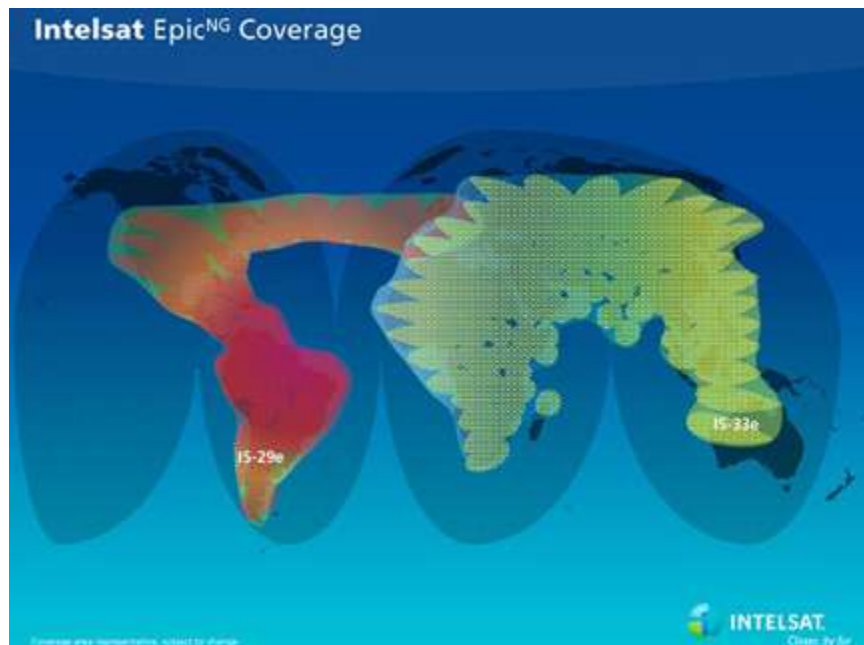
(Kindly refer to ITU paper ITU-R12 Ka Band) on this subject).

We would like to emphasize that one of the factors in affordable use of DTH and Broadband services is also the spectrum charge policy of WPC. Currently the WPC charges for Spectrum for DTH and Broadband are exorbitant and would make such implementations impractical.

At present the entire Ka- Band spectrum of the country is lying unutilized as the policy on such use has not drawn regulatory attention.



Even for Ku-band, which is used by DTH operators, new technologies are now available which lead up to a tenfold growth in data rates. Intelsat EpicNG will use spot-beam and frequency-reuse technologies that concentrate the signal from a transponder over a small area. This will allow for higher modulation schemes that dramatically increase the number of bits customers can push through the megahertz, resulting in lower cost per bit delivered. The Intelsat EpicNG platform will enable throughput in the range of 25-60 Gbps, about 10 times that of traditional satellites.



The use of the Ka-band for mobility networks is a relatively new concept because the spectrum has not been widely adopted by satellite operators due to its susceptibility to interference from rain and other weather conditions. Satellite operators who have ordered new Ka-band satellites believe they have developed technologies that help mitigate the rain-fade problem. So, a key decision for the end-user will come down to which type of satellite offers the most throughput for the money and the most network flexibility. The new Intelsat EpicNG platform will take the Ku-band to a whole new level of performance while offering compatibility with existing ground networks.

With reference to table 2.9 of the consultation paper (placed below):

Table 2.9

Sl. No.	Spectrum band (MHz)	Band Size (MHz)	Remark
1.	1885-2025	140	WARC-92, Globally
2.	2110-2200	90	WARC-92, Globally
3.	806-960	154	WRC-2000, Globally
4.	1710-1885	175	WRC-2000, Globally
5.	2500-2690	190	WRC-2000, Globally
6.	450-470	20	WRC-07, Globally
7.	2300-2400	100	WRC-07, Globally
8.	790-862	72	WRC-07, Region-1 and Region 3
	698-806	108	WRC-07, Region 2 plus nine countries in Regions 3 including India.
9.	3400-3600	200	WRC-07, No global allocations, but identified by over 80 administrators in Regions 1 plus 9 in Region 3 including India, China, Japan and Rep. of Korea).
Total Identified Spectrum for IMT:		Global-	869 MHz
		Region wise-	72/108 MHz
		Country specific-	200 MHz

Zee would like to indicate the following:

3400-3600 MHz Band

At the outset we note that the Authority has noted that this band is being used by ISRO.

- We do not recommend that the band of 3400-3600 MHz be used for IMT allocations. Instead it should be preserved and used for Extended C-band services. The use of WiMAX/ Mobile WiMAX or 4g-LTE in this band will lead to severe interference in satellite services in the C-band.

We would like to reassert that the 3.3-3.6 GHz band is the lower extended C-Band and is already being used for satellite services. In countries where WiMAX services have been introduced, there

have been significant in-band and out-of-band interference issues and services interruptions for satellite ground stations and their related services. We are aware of interference interruptions which have occurred throughout Africa, and in Australia, Bolivia, the Caribbean, China, Fiji, Hong Kong, Indonesia and Russia.

A Report recently issued by The Office of the Telecommunications Authority (OFTA) in Hong Kong concluded that without the implementation of technical constraints (principally geographic separation and the use of LNB filters) -- which would be costly for both BWA operators and FSS users -- the deployment of BWA services in the 3.5 GHz band would lead to interference problems in the entire C band (3.4 – 4.2 GHz), making a wide and cost-effective deployment of BWA systems in a small place like Hong Kong difficult. In the conclusions to the Report, OFTA also noted that these interference problems have been increasingly reported in places outside of Hong Kong. Broadband Wireless Access and IMT services are similar in that they are both characterised by a large number of ubiquitously deployed base stations and user terminals. FSS satellite systems deliver extremely weak signals which are highly sensitive in both the standard and extended C band frequencies. The most effective solution to avoid interference from these services is to separate the systems by implementing exclusion zones around existing FSS earth stations. The need for exclusion zones has been recognized by the ITU-R (including WP 8F) and several ITU studies within Working Parties 4A and 8F. However, exclusion zones are impractical in the case of ubiquitously deployed C-band antennas (as such zones can not be defined) and for C-band antennas at known locations the width of such zones may go up several hundreds of km, preventing therefore the deployment of terrestrial IMT in large areas. Furthermore, the implementation of exclusion zones would negatively impact the ability of FSS operators to expand operations beyond existing earth stations.

The only effective solution to protect satellite services in the extended and standard C band frequencies is to separate them from terrestrial systems such as WiMax or BWA by several to thousands of kms, or to find other spectrum for these services to operate.

Even the WiMAX Forum, which is the worldwide body for governing the standards or WiMAX systems and its promotion has admitted in its report "COMPATIBILITY OF SERVICES USING WiMAX TECHNOLOGY WITH SATELLITE SERVICES IN THE 2.3 - 2.7 GHz AND 3.3 - 3.8 GHz BANDS (<http://www.wimaxforum.org/technology/downloads/SatelliteWhitePaper.pdf>) that the operation of WiMAX systems results in a significant interference in the C- Band satellite communications. Its findings are as under(paper cited above):

The general conclusion drawn is that the ease of deployment of WiMAX systems in these bands is very much dependent on the extent to which satellite earth stations are already deployed in the country concerned and the amount of spectrum that they occupy and the situation in each country needs to be assessed on a case-by-case basis. We would like to reassert that the 3.3-3.6 GHz band is the lower extended C-Band and is already being used for satellite services. In countries where

WiMAX services have been introduced, there have been significant in-band and out-of-band interference issues and services interruptions for satellite ground stations and their related services. We are aware of interference interruptions which have occurred throughout Africa, and in Australia, Bolivia, the Caribbean, China, Fiji, Hong Kong, Indonesia and Russia.

Annexure-1 Conflict of IMT, WiMAX and Satellite Bands

ITU WRC 2007 Outcome

The ITU World Radiocommunication Conference (WRC) 2007 was held from 22 October-1 November with a resulting landmark decision on preserving the C-band spectrum for interference-free delivery of satellite communications. Thanks to overwhelming demonstrations of support by national administrations, the communications user community and the global satellite industry, WRC decided to restrict International Mobile Telecommunications (IMT), including WiMax, from any part of the satellite C-band (3.4-4.2 GHz). The ITU table of allocations remains unchanged with the limited number of countries in favor of change identified in an opt-in footnote. By taking this approach, the world's regulators participating in the WRC have made it clear that the C-band is off limits for IMT.

The WRC further restricted IMT, which includes WiMAX, specifying adherence to stringent requirements for the protection of existing and future satellite services in the C-band, including trans-border protection. For example, in Region 2 (the Americas and the Caribbean), there is no identification for IMT, just an upgrade through a footnote, in 14 countries of the mobile service allocation in 3.4-3.5 GHz. In Region 3, only eight countries inserted their name to the footnote identifying IMT. Only in Region 1 was there broader support from countries to be included in the footnote identifying IMT for national use.

Use of 698-806 MHz Band for IMT Services

We note that in Para 2.65 of the consultation paper the TRAI has noted a previous recommendation as follows:

In its recommendation on 'Spectrum Management and Licensing Framework' dated 11th May 2010, the Authority had recommended that 698-806 MHz be earmarked only for IMT applications.

Zee would like to point out that the Spectrum in question is used for Terrestrial Broadcasting. With the advent of DVB-T2 and DVB-T2 (Lite) it can be used to deliver services to millions of customers including on their smartphones or mobile devices. The technologies indicated support wide use of broadband data such as weather, crop, market prices and other such information.

So far as the IMT is concerned, the subject operators should use the spectrum allotted to them post auctions for Broadband and npt allow it to be diverted for voice applications.

India needs such innovative solutions which can help the existing DTH operators which already operate services to 50 million customers and growing at 25-30% per annum to leverage the existing investments with additional services.
