

**VIA E-MAIL**

[sudhircgupta@trai.gov.in](mailto:sudhircgupta@trai.gov.in)

May 16, 2008



Sh. Nripendra Misra  
Chairperson  
Telecom Regulatory Authority of India  
Mahanagar Door Sanchar Bhawan  
Jawahar Lal Nehru Marg (Old Minto Road)  
110 002 New Delhi  
India

**Ref.: Consultation Paper on Allocation and Pricing for  
2.3-2.4 GHz, 2.5-2.69 GHz & 3.3-3.6 GHz band  
Consultation Paper No. 8 /2008**

Dear Sir,

Intelsat would like to thank the Telecom Regulatory Authority of India (“TRAI”) for the opportunity to participate in this public consultation on amongst, other things, the allocation of frequencies within the 3,300-3,600 MHz band for broadband wireless access (“BWA”) services.

As way of introduction, Intelsat is the world’s leading commercial satellite communications services provider, and the largest provider of fixed-satellite services (“FSS”) worldwide. Intelsat delivers advanced transmission access for information and entertainment to some of the world’s leading media and network companies, multinational corporations, Internet service providers, and government organizations around the world, among other users. Every year Intelsat helps millions of people stay connected to the things they care about. Satellite capacity has always been the backbone of Intelsat, and our satellites allow us to offer seamless service for voice, data and video transmissions.

As the TRAI is aware, the 3,400-4,200 MHz frequency bands (commonly referred to as C-band frequencies) have long been used by satellite operators around the world for a multitude of services, including services in India. Today, there are approximately 160 satellites operating and providing essential and critical services to consumers using C-band frequencies, and many more such satellites are under construction. Satellite receive earth stations operating in the C-band constitute the primary means for distribution of television and broadcast programming to

cable companies throughout the world and in India, as well as for data transmission services, and telephone and internet connectivity services for millions of users. At the same time, satellite services in the C-band help to enable public policy objectives such as safety (emergency services) and cultural issues (broadcasting). Many Indian entities depend on and benefit from the various advantages of satellite communications using C-band.

Satellite solutions provide an excellent vehicle for government and emergency services. In times when disaster recovery is needed, satellites are often the only possibility to establish communication links. For example, C-band satellites were used to provide emergency communication services in Peru following the earthquake of 2007; similarly, satellites were used in Taiwan to restore critical connectivity after earthquakes severed submarine cable connections in 2006, and in Thailand, after the devastating tsunami of 2004.

It is critical that satellite systems and the users of such systems continue to be able to use C-band frequencies without harmful interference from terrestrial wireless access systems and other wireless systems that plan to deploy in C-band frequencies. As it has been well documented by the international community, the harmful interference caused by wireless access and mobile systems on satellite systems in C-band frequencies deprives consumers of access to vital satellite services.

The concerns regarding this matter were reflected in the actions of the recently concluded World Radiocommunication Conference (“WRC-07”) held by the International Telecommunications Union (“ITU”) in Geneva, Switzerland. Agenda Item 1.4 for WRC-07 addressed the identification of spectrum to be used by International Mobile Telecommunications (“IMT”) systems. In particular, 3,400-4,200 MHz was one of the candidate bands considered. WRC-07 decided expressly **NOT** to adopt a global identification of radio spectrum for IMT systems in any part of the 3,400-4,200 MHz band. In the ITU Regions 1 (Europe/Africa) and 3 (Asia), spectrum for IMT was identified, through footnotes to the Table of Frequency Allocations, in the 3,400-3,600 MHz band and **only** in certain countries. Moreover, WRC-07 explicitly adopted provisions to ensure the protection of FSS receive earth stations that operate in these frequency bands in the two ITU Regions where spectrum for IMT spectrum was identified.<sup>1</sup>

The concerns with the use of C-band by stand-alone terrestrial fixed wireless systems, including IMT, derive from the harmful interference that would be caused to the numerous, deployed FSS earth stations operating in these bands. In this regard, it is important to underline that the interference problem generated by wireless access systems, such as BWA and IMT, is not

---

<sup>1</sup> Certain footnotes were included in the ITU Table of Frequency Allocations to cover frequency bands within the 3,400-3,600 MHz range. These footnotes allow the operation of IMT in a co-primary allocation to the mobile service, but **only** in those countries which have opted-in to the footnote in the corresponding ITU Region, and **only** if the protection of FSS receive earth stations in affected Administrations is ensured. India was among those countries in Region 3 that opted-in to footnotes covering the 3,400-3,600 MHz band. Effective **November 17, 2010**, the 3,400-3,600 MHz band in certain countries of Region 3 (including India) can be used IMT systems and the mobile service allocation in the band 3,400-3,500 MHz, which is currently secondary, becomes primary. Use by IMT systems is subject to a limit on the power flux-density (“pfd”) generated by an IMT transmitter at the border of the territory of any other administration and to coordination with affected administrations pursuant to Article 9 of the ITU Radio Regulations.

limited to co-frequency band operations among these services, but also relates to the harmful effects from deployment of these new terrestrial systems in adjacent bands -- for example, a terrestrial system operating in the 3,300-3,400 MHz band interfering with FSS receive earth stations operating in bands above 3,400 MHz.

It is particularly important to emphasize that FSS receive earth stations that today use C-band frequencies are extremely susceptible to harmful interference and receiver overdrive (e.g., causing total loss of service, blackouts, synchronization loss and signal delays) generated by transmissions in co-frequency or adjacent frequency bands. Deployment of stand-alone fixed BWA systems in the same geographic area and in the same or adjacent C-band frequencies in which satellite systems operate, substantially compromises the operation of FSS receive earth stations, rendering them inoperable and thus depriving consumers of service. ITU technical studies come to this same conclusion,<sup>2</sup> as have technical studies in the Asia-Pacific region and other regions of the world,<sup>3</sup> and are made evident by the recent cases in which satellite receive earth stations in C-band have experienced harmful interference.<sup>4</sup>

It is our hope that the TRAI will adopt policies for the use of C-band frequencies that offer protection for longstanding FSS systems in these bands, and will not impose undue constraints on satellite services operation in India and throughout the region. We further hope that the policies of the TRAI will reflect the strong concerns of the satellite industry -- as evidenced by the results of WRC-07 -- with respect to in-band as well as adjacent band interference from terrestrial services to FSS systems. More specifically, Intelsat urges the TRAI to consider the utilization of other available frequency bands for the deployment of terrestrial wireless access services in India. Intelsat strongly supports the allocation of the 2.3-2.4 GHz and 2.5-2.69 GHz frequency bands for BWA and other terrestrial wireless access systems. As the TRAI has recognized in the Consultation Paper, these frequency bands have been identified by the ITU for use by next-generation mobile technologies, and offer "significant scope for innovation with the potential for introduction of new technologies, services, applications and devices".<sup>5</sup> To the degree that the TRAI decides to move forward with deployment of BWA and other terrestrial wireless systems in the lower portions of the C-band, we would request that strict out-of-band

---

<sup>2</sup> Report ITU-R M.2109 presents the results of the different sharing studies performed between the FSS networks using the geostationary satellite orbit and IMT-Advanced systems. See REPORT ITU-R M.2109, *Sharing studies between IMT-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 and 4 500-4 800 MHz frequency bands* (2007).

<sup>3</sup> Technical studies conducted within the Asia-Pacific Telecommunity ("APT") and other organizations on the technical feasibility of deploying terrestrial networks in large numbers within a portion of the 3,400-4,200 MHz band have shown that, in order to provide protection of the FSS receive earth stations, some separation distance relative to the stations of the terrestrial network is required. The magnitude of this separation distance depends on the parameters of the networks and the deployment characteristics of the two services.

<sup>4</sup> In countries in which the deployment of terrestrial wireless access systems has been allowed in C-band, satellite systems have experienced massive problems and service interruptions. In addition, it is possible that interference will affect radars and microwave links that operate in these bands. Satellite systems in places like Australia, Bolivia, Fiji, Hong Kong, Indonesia, Pakistan and countries in Africa have been negatively affected by these deployments of terrestrial systems.

<sup>5</sup> Consultation Paper, at Preface.

emission limits are imposed on such systems in order to protect the critical and widespread FSS services already deployed in the higher portions of the C-band. Moreover, we believe it is necessary to impose appropriate power limits on IMT transmitters to prevent saturation of FSS earth station receivers operating in the adjacent band.

Intelsat thanks the TRAI again for the opportunity to comment on the Consultation Paper, and looks forward to your feedback on the above and your views on the future plans with regards to the allocation of C-band frequencies in India for BWA services.

Respectfully,



Kalpak S. Gude  
Vice President and Deputy General Counsel

Cc: Sh. Sudhir Gupta, Advisor (MN)