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To :

Shri Sudhir Gupta, Pr. Advisor (MS), TRAI,
Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan
Jawahar Lal Nehru Marg (Old Minto Road), New Delhi-110002
Telephone No: +91-11-23220018,
Fax No: +91-11-23212014
Email: pradvmn@trai.gov.in

From : Panasonic India Pvt.Ltd.

Subject: Comments on TRAI Consultation Paper No. 9/2011
“Allocation of Spectrum Resources for Residential and Enterprise Intra-
telecommunication Requirements/ Cordless Telecommunication Systems (CTS)”.

Company presentation

At the outset we thank you for the opportunity to comment on the subject issue.
First of all, please find a short introduction of our Corporate Profile.

We are a part of Panasonic India pvt. Ltd., with administrative head quarters at Gurgaon,
India handling Panasonic's system network business.

We are committed to being a company that always does everything it can for the benefit
of our customers. Our strengths are the technological capabilities we have built up in a
wide range of fields, including IP, our expertise in exceptional manufacturing practices,
and our many years of experience in system construction. We have four major business
fields: Communication, Security, Imaging and Mobility.

Moreover, by combining these mainline businesses we are developing a lineup of
products that enable a variety of solutions, centering on communication and security, to
be provided globally. Going forward, we intend to create more new businesses in the
areas of integrated IP solutions and the environment.

- **Communication:**
We provide simplicity, convenience and security with unified communications
that fuse audio, video and data. (eg: PSTN / VoIP corded and cordless Phones,
Facsimile, Video Intercom, PBX, and HD Video conference system)

- **Security**
We provide integrated security solutions, from video monitoring and entry/exit management systems to network services, by creating systems that use connecting technology to integrate a full lineup of video cameras--ranging from security and other monitoring applications to industrial applications--as well as recorders, card readers, sound equipment and other devices to contribute to the realization of a safe, secure and smart society.
- **Imaging**
We provide a wide range of solutions for offices and education by integration of imaging and communication technologies, with Multi-function Printer, Document Scanner, and Interactive white board.
- **Mobility**
We provide products that help raise the efficiency of transportation and logistics, electronic money and credit, and other services, aiming to make business and society smarter, with Payment terminal, POS reader / writer, RFID reader / writer, Passport reader.

We employ a number of approx. 11.000 employees as a group total and our revenue is amounting to 5,500 crore rupees in India.

Regarding to Cordless Phones we are one of the leading global manufactures with operations in Europe, USA, Latin America, CIS, Oceania, Middle East, Africa, Asia and Japan.

Issues for Consultation

3.1 Whether the current allocation of spectrum for CTS is sufficient to meet the requirements? If not, then how to meet the demand of cordless telephony spectrum requirements?

Answer:

The current allocated spectrum for digital CTS is NOT sufficient. Because the market demand of residential and business enterprise digital CTS applications is getting bigger toward New Generation Network. However it is getting difficult for digital CTS to coexist in 2.4-2.4835GHz, and 5GHz frequency band which is mainly used by Radio Local Area Networks (GSR 45E, GSR 46E) to keep transmission quality. The reason is due to the difference of the frequency occupation characteristic and moreover the market demand of RLAN is also getting bigger due to progress of internet. Therefore new allocation of spectrum for digital CTS is very much expected. The way to meet the demand of digital CTS should be license exempt protected (defined by a coexistence etiquette) TDD spectrum in the blocks 1880-1900 MHz and/or 1910-1920 MHz to provide state of the art residential and enterprise mission critical voice and medium rate data services. As TRAI investigated, major digital CTS technology DECT is getting to expand in the world and that frequency band of 10MHz - 20MHz within 1880-1930 MHz is usually allocated depending on the country or region. Therefore it is the most cost effective because of large installation base.

3.2 In view of the availability of cellular mobile services in the country and possibility of Fixed Mobile Convergence (FMC), is there any need to have DECT Phones?

Answer:

Yes, there is a need for DECT phones. Because DECT is able to provide efficient solution for private space. Especially DECT technology can provide attractive advantages including high quality wideband audio service, ultra low energy (ULE) service such as sensor and controller which are driven by consumer battery for several years. These are not available in case of cellular mobile technology even in FMC. We estimate those useful applications will be widely diffused for residential usage. Furthermore, DECT enterprise systems provide on-premises local mobility and full coverage through seamless handover between pico-cell base stations. The services offered are the wireless PBX telephony service and different low and medium rate data services for supervision, control, maintenance and alarms. The DECT local mobility pico-cell system is preferred when the cellular service is unable to provide the required quality, coverage, services or required integration with local key administrative and production systems.

3.3 Is there any requirement of allocating spectrum for digital CTS, in view of similar solutions being available in already de-licensed band 2.4 & 5.8 GHz?

Answer:

Yes, it is preferable for digital CTS that the frequency allocation is protected or coexisting with similar technology (TDMA/TDD) to use the frequency band effectively by etiquette rule.

Because there is a basic difference between coexistence properties on a DECT band and on an ISM band (Wi-Fi). DECT is guarantee service during it links, so it is very suitable for high quality voice and mission critical real time medium rate data applications. In contrast, Wi-Fi is best effort service because ISM band is unprotected and unpredictable to use spectrum effectively, so Wi-Fi is very suitable for high rate packet data services with non-time-critical retransmissions. DECT and Wi-Fi are complementary technologies and cannot substitute each other. This leads the allocating spectrum for digital CTS should be protected. This is proven on the Europe and US markets where both a DECT spectrum and the ISM bands 2.4 & 5.8 GHz are allocated.

Furthermore, if allocating spectrum for digital CTS will be shared with other technology, it would be necessary to specify a coexistence rule to avoid harmful interferences each other. In that case, it is preferable to coexist with similar technology (TDMA/TDD) for working effectively. This is proven on the Japan and Australia markets where both DECT and private PHS share the de-licensed allocating spectrum for digital CTS.

It is obvious that India needs a 1880-1900Mhz license exempt protected TDD spectrum (defined by a coexistence etiquette) to provide state of the art residential and enterprise mission critical voice and medium rate data services.(Table 1.7 of TRAI paper substantiates that DECT is prevalent in all the major countries as now it is even adopted in JAPAN)

3.4 Whether de-licensing of the spectrum for digital CTS applications will be the right path?

Answer:

Yes, de-licensing is the right path.

Digital CTS has to be license exempt to be successful on the market, since it is utilized for private application in home and office. It is the same way that de-licensing has been the key for the success for the Wi-Fi technology on the 2,4GHz and 5 GHz ISM bands, although the earlier analog CTS band was already de-licensed. A licensing regime cannot be practically implemented for residential and SOHO applications.

3.5 Do you agree that the 1880-1900 or 1910-1920 MHz band (TDD Mode) be allocated for digital CTS applications? If yes, what should be the limits of emitted power (EIRP), power flux density (pfd), antenna gain etc?

Answer:

Yes, the 1880-1900 or 1910-1920 MHz band (TDD Mode) should be allocated for digital CTS applications.

The maximum transmit power should be 250 mW referring to chapter 2.5 for coexistence with multiple operation and coordination. Regarding the antenna gain, it should be considered subject to coordination. European harmonized standard specifies up to 12 dBi, however in the ITU specification of DECT, ITU IMT-2000 TDMA/FDMA (DECT), 4 dBi is specified, in US 3 dBi, and in Japan 4 dBi is specified for digital CTS systems. In Japan case, it was considered to specify by the radio propagation calculation and the Monte Carlo simulation using interference model between digital CTS systems and cellular systems. To consider the interference model, it is important to specify not only antenna gain, but also unwanted spurious emission value. It is hard to change the unwanted spurious emission value, since its value depends on the radio systems devices in accordance with each regulation. Therefore the antenna gain has to be considered subject to coordination.

3.6 Do you see any coexistence issues between existing cellular systems using adjacent band with low power CTS allocations in 1880-1900 or 1910-1920 MHz band?

Answer:

No harmful interference is to be expected.

Because CorDECT which is similar to DECT radio characteristic is already allocated in India. So its interference issue to the other radio systems including the cellular mobile system using adjacent band should be already considered. This consideration should be available for also DECT which radio characteristics are same as CorDECT. The studies and hundreds of millions of DECT installations all over the world confirm good coexistence properties and there are no complaints.

3.7 Whether the de-licensing of either 1880-1900 MHz or 1910-1920 MHz band for low power CTS applications will result in loss of revenue to the government?

ECT is around the world allocated within the guard band between cellular up-links and down-links. These guard bands are very difficult to use for public cellular systems. Using them for low power state of the art CTS to the benefit of the general Indian public will cause indirect revenues (through duty structure and manufacturing base etc.,) to the Indian society.

3.8 Will there be any potential security threat using CTS? If yes, how to address the same.

No, there will be no potential security threat using CTS.

Because DECT as the digital CTS uses ciphering and authentication with the same security level as GSM/UMTS when it makes radio link.

3.9 Amongst the various options of digital technologies available to meet the cordless telephony requirements, either spectrum allocation can be considered according to technology or the etiquettes/ specifications can be defined for the de-licensed spectrum band. What method of allocation of spectrum for digital CTS applications should be adopted?

Answer: Since frequency is finite resource, the equipments should access the entire common spectrum comply with coexistence etiquette, rather than splitting the spectrum into sub-bands for different technologies. And they should be an equal condition to use allocated spectrum for fear of exclusive or priority use.

Therefore following specification would be needed.

Occupied Bandwidth, Peak transmit power, Antenna gain, Carrier sense level (busy threshold) prior to transmission, Strength of unwanted emission, Maximum transmit period, etc.

Furthermore, it is preferable to be utilized similar technology (TDMA/TDD) for working effectively by etiquette rule.

3.10 Any other issue?

The consultation paper is well written and has presented the DECT license exempt case very well. However there was one fact to add.

The Ministry of Internal Affairs and Communications in Japan has amended the technical regulations for the digital CTS on 26 October, 2010 to allow the technical conditions of the scheme compliant with DECT. That is license exempt spectrum, and allocated frequency of 1893.5-1906.1 MHz band. This band was the same as earlier de-licensed PHS for private systems. Therefore both DECT and PHS have to comply with coexistence etiquette.

For any questions please contact

Premanand .R / Virender Kumar / Niranjan Limaye
Panasonic India Private limited.,

5th floor, ABW towers,
Sector-25, MG Road,
Gurgaon
Delhi – NCR.

E-Mail:

virender.kumar@in.panasonic.com,
premanand.ravirajan@in.panasonic.com
niranjan.limaye@in.panasonic.com

Phone: +91 124 6676408

FAX: +91 124 6676409

Headquartered in Osaka, Japan, **Panasonic Corporation** is a leading global manufacturer of electronic products and solutions for consumer, business and industrial needs. Panasonic uses innovative technologies to provide solutions, not just products, to make everyday home and business life simpler, convenient and energy efficient. With a clear vision to become the number 1 Green Innovation company in the worldwide electronics industry by year 2018, Panasonic strongly believes in designing products and solutions keeping the environment in mind. Under its global Eco Ideas umbrella, the company develops energy-efficient, state-of-the-art products and encourages customers to live eco-conscious lifestyles with an aim to reduce carbon emissions in households and manufacturing units.

- **Workforce:** Panasonic has a strong workforce of over 360,700 people (consolidated) spread over 611 companies (consolidated including parent company) across the world.
- **Turnover & Operations:** USD 105 billion and operations panning across nine countries. The company has built 297 manufacturing facilities across the world, and has an annual spend exceeding USD 5 billion on research and development.
- **Ranking worldwide:** Panasonic is ranked 65th on the Fortune 500 list of the largest global corporations, ranked 4th on the Fortune 500 Index of 'Electronics and Electrical Equipments'; and is on Forbes' World Super 50' list.
- It recently acquired Sanyo with a USD 9 billion deal, making it the world's second largest conglomerate in the electronics industry.

Panasonic in India

Panasonic commenced its operations in India in the year 1972 and has shown a 200 percent growth in the past three years; and visions to become India's largest electronics and durables brand by 2018. At Panasonic, designers and engineers constantly endeavor to ensure that each evolution of product is better than its previous version by following stringent process to develop products that are more energy efficient, water efficient and durable.

- **Workforce** of 10,500 people across India currently
- **Market outreach:** Over 110 exclusive Brand Shops pan-India and over 700 service centres to provide one-stop solutions. Panasonic currently has 22 branch offices
- **Turnover:** Panasonic India registered healthy sales of USD 628 million in FY 2010 and has recently invested USD 300 million in the country to set up an R&D and manufacturing facility and on various marketing initiatives.
- **Panasonic largest manufacturing Unit at Jhajjar** is under construction and is envisaged to be completed by April 2012. The unit will house facilities that can manufacture an estimated 1,000,000

sets of air conditioners, 400,000 sets of washing machines and 25,000 sets of welding and cutting machines per annum. The new unit will manufacture air-conditioners, washing machines, welding and cutting machines after March 2012; with an investment of about US \$200 million over a period of five years and the mass production will start in August 2012.

Panasonic India Pvt. Ltd. (PI) operates through following companies/divisions:

- **Consumer Product Division (CPD):** Makes available consumer electronics appliances from the Panasonic stable.
- **System Sales Division (SSD):** Makes available display, projectors, telephones, PBX/KTS, fax machines, security and networking products.
- **Panasonic Automotive Systems India (PASI):** Specializes in sales and support of in-car equipment and systems that provide comfort, such as multimedia equipment, safety, environmental protection and power management solutions.
- **Panasonic Industrial India (PIIN):** For making available compressors, motors for air conditioners and refrigerators, various types of batteries for application such as UPS, E-Bike / windmill, solar energy systems, and many other industrial applications, components for printed circuit boards (capacitor, resistor, coil, switches, sensors, semiconductors, and more), flat and plasma panel for flat TV and plasma TV, heat exchanger for BTS relating applications, welding and SMT equipments for manufacturing industry.
- **Panasonic Home Appliances India Co. Ltd [PHAI]:** For manufacture, import, marketing and sales of kitchen appliances and small domestic appliances. Product categories include beauty care, personal care and health care items. PHAI is headquartered in Chennai, Tamil Nadu.
- **Panasonic AVC Networks India Ltd [PAVCI]:** For manufacturer of CRT TVs and LCDs. PAVCI is based in Noida, UP
- **Panasonic Energy India Co Ltd [PECIN]:** For manufacture and sales of dry cell batteries. PECIN is based in Baroda, Gujarat.
- **Panasonic Carbon India Co Ltd [PCIN]:** For manufacture and sales of carbon rods. PCIN is based in Chennai, Tamil Nadu
- **Panasonic Welding Systems India [PWSI]:** For manufacture of arc welding equipments and related products based in Gurgaon, Haryana.
- **Anchor Electricals:** A wholly owned subsidiary of Panasonic electric works which manufactures over 3000 products under 20 major product groups including Switches and Wiring devices, Wires and Cables, Circuit breakers & Protection devices, Fans, Lights & Luminaries and caters to core sectors of the Indian infrastructure economy viz., Electrical and Electronics Industry.

- **Sanyo and Panasonic Electric Works:** Product categories presently being handled are LCD Projectors, LCD TVs, Cold Chain, Commercial Air-conditioning, and Compressors for commercial AC, Solar etc. The company has fully amalgamated with Panasonic Corporation

Product categories:

- **Digital audio-visuals:** Plasma/LCD/3D TVs, DVD players, cameras & camcorders
- **Home appliances:** refrigerators, washing machines, air conditioners, microwave ovens, rice cookers & mixer grinders
- **Health & Beauty appliances:** handheld massager, water purifier & hair dryer
- **Professional communications:** cordless phones & faxes
- **Business solutions:** multi-function copiers & notebook PCs
- **Professional audio-visuals:** professional cameras & security systems.
- **Industrial components:** compressors, motors for Air conditioners & Refrigerators; Batteries for industrial applications; Flat and Plasma panels; - Welding and SMT equipments for manufacturing Industry
- **Car equipments:** in-car equipment and systems

For further information, please contact:

Panasonic India
Richa Sethi
+91 9560498765
richa.sethi@in.panasonic.com

Genesis Burson Marsteller
Malvika Sinha
+91 9873382955
malvika.sinha@bm.com