

## **BBC Response to Draft RSPG Work Programme for 2012 and beyond**

### **Introduction**

The BBC welcomes the opportunity to comment on the draft RSPG Work Programme for 2012 and beyond.

The BBC as a Public Service Broadcaster is required by its Charter and Agreement to deliver its services to virtually everyone in the UK, through terrestrial television, as well as through other main distribution delivery, in particular satellite. Only by using terrestrial networks, can it meet its remit. Therefore, it uses extensively the broadcasting bands for the terrestrial distribution of programmes, but also uses Ku and C Bands for satellite broadcasting and distribution. The BBC also uses radiofrequency spectrum for programme making (PMSE, for wireless camera and microphone technology) and for programme ingest and distribution (Fixed and mobile links)

Concerning the proposed RSPG work programme for 2012 the BBC would like to provide the following comments:

#### ***1) Future spectrum for Wireless Broadband***

It is of the utmost importance that future allocations of spectrum for wireless broadband take account of the needs of current users, and minimise the impact on them. Robust protection criteria must be included to ensure there is no harmful interference to adjacent users. This is a particular concern where allocations are adjacent to broadcast bands used for television or radio as domestic broadcast receivers will in all probability not contain suitable filtering, and consumers might lose their television services without further action. In addition, where such receivers are used for mobile / portable reception it is unlikely to be possible to retrofit a suitable filter

For example there is already considerable work being undertaken in various bodies such as ITU and in the UK by the regulator Ofcom concerning the re-allocation of the 800MHz band for wireless broadband – considerable efforts will be required to ensure adequate protection of existing terrestrial television services. It is also worth noting that some characteristics of the proposed usage – in this case an insufficient guard band between the planned mobile services and the existing TV services – are making the implementation of mitigation measures significantly more difficult. It is strongly recommended that this issue should be studied in detail before any further such re-allocation.

#### ***3) Increasing opportunities for shared use of spectrum***

Any plans for increasing the shared use of spectrum must give sufficient interference protection. Any consideration of bands currently used by satellite must consider sufficient protection to ensure out of band emissions do not increase the noise floor in the satellite bands. All work in this area must be considered in the light of the work undertaken in section 4 – Furthering efficient interference management through the exchange of regulatory best practices concerning regulation and /or standardisation.

An area that is also currently being studied concerns the TV white-spaces. There is a considerable amount of work being undertaken within the UK and internationally for

example by the EBU and CEPT. There is still much to be done in terms of standardising protocols, emission masks and methods for adopting harmonised protection requirements, and there would be significant benefit from ensuring a common approach can be adopted across the EU, whilst at the same time providing adequate protection to television services.

***4) Furthering efficient interference management through the exchange of regulatory best practices concerning regulation and / or standardisation***

It is the opinion of the BBC that this activity should be expanded to include interference to broadcast and communications reception caused by devices not intended to radiate. An example of such a technology is Power Line Communications (PLC), such devices can cause emission across a wide range of frequencies and where these emissions are in band it will not be possible to filter the input to remove this interference. The radiation from such devices is a product of the interaction between the PLC device and the mains wiring to which it is connected and not per se a function of the device. (Further details of concerns surrounding PLC are contained in Annex 1)

Further work should also be undertaken on interference generated through the shared use of spectrum. Current areas of concern are the interaction between broadcast TV and white-space devices and between satellite systems and Broadband Wireless Access (BWA) systems such as WIMAX.

## **Annex 1**

### **Power Line Communications (PLC)**

#### **1. Introduction**

PLC uses the power network to provide communications, and is variously known as PLT or BPL.

In many situations it is seen as an alternative to conventional wireless communications. However the power network wiring was not designed for use by high bandwidth signals, and as a result energy is radiated from the wiring with potential for interference to radio services. Attempts to reduce the transmission levels to emission levels comparable to that from other appliances have been made within the IEC (CISPR).

It should be noted that PLC operates in a commercial market where there is a drive to produce products with ever better specifications (faster data over longer distance), hence the move towards even wider spectrum usage. There is an urgent need for a co-ordinated approach to address this problem at the European and international levels.

#### **2. Background**

PLC is not a radio service; consequently frequency allocations are not possible under the present regulatory system. Currently most PLC products operate in the HF frequency range (2- 30 MHz), but all spectrum from LF (9 kHz) to UHF and possibly beyond are under consideration. However they currently focus on using the HF spectrum.

It must be noted that these systems can not only cause problems for broadcast radio services but to broadcast television and to all other radiocommunication services operating in the bands where interference might be generated. Additionally PLC also poses a threat to conventional broadband telecommunication services.

Whilst countries have regulatory regimes to control interference to radio services, they have not been easy to enforce for PLC and countries are moving towards introducing limits on PLC devices that are substantially above their current interference levels in an attempt to limit the potential interference.

Many consider that this is a dangerous move that could lead to a general relaxation of interference emission limits which would lead to a reduction in radio service areas.

It should be noted that PLC in its various guises has many uses. Whilst one of its earlier uses as an alternative means of broadband internet access has failed to materialise, the use for home networks as an alternative to Wi-Fi has flourished, in particular for streaming video on demand around the home. A further potential growth area for PLC is seen as SmartGrid and Smart Metering.

In the past, the development of PLC in Europe has been encouraged by the European Commission as an alternative to telecommunications for broadband delivery systems. This has been proven not to be practically viable. This was done without realisation of the need for devices to comply with the normal EMC emissions criteria, consequently significant relaxations are needed for PLC to operate.

#### **3. Discussion**

The need for devices to communicate is essential for the development of our modern society; this can be either by wired or wireless methods. The present regulatory regimes do not have the mechanism to co-ordinate these two options. In particular the RSPG should advise which, if any, parts of the spectrum could be used for PLC services.

PLC is seen as one of the means of implementing SmartGrid, and there is a need to agree the standards for SmartGrid and Smart Meters as this is a key technology to contribute towards the goal of reducing global energy usage and carbon emissions. Whilst the RSPG should enable these issues to be resolved at the European level, there is a need for it to also be resolved at the international level. Consequently it is important that the ITU becomes actively involved in this area. This will require the involvement of both sectors of the ITU, and greater involvement with the IEC. The optimum solution may be for this to be raised in the WSC<sup>1</sup>.

It is noted that the PLC industry is developing its own standards within the IEEE<sup>2</sup> and that if action is not taken, then these could become *de facto* international standards to the possible detriment of radio services.

It has been noted that whilst the HF band is providing key services for broadcasting and communication – particularly in the third world, the lower VHF band (30-80 MHz) is currently only lightly used. Consequently thought should be given to whether this should be an area that PLC should be directed to, with a possibility of giving PLC a permitted status in this band.

#### **4. Specific Concerns**

- LF mains signalling systems are proposing to use PLC technology and extend the present band above 150 kHz to 540 kHz. In Europe this will impact LW and some MW broadcasting services.
- Present PLC systems are using all the HF bands, and have to notch out certain frequencies to reduce interference to services such as amateur radio. There are technical difficulties regarding the notch depth, but despite this there are proposals for a higher power levels to enable reduce operational costs. The widespread use of PLC for SmartGrid may prevent the rollout of the planned DRM services. Permanent notching of the Broadcast bands is not considered practical, and there is some opposition to using an active dynamic notching technology.
- There are serious concerns that PLC will adversely affect Band II services. It is noted that the FCC have limited PLC<sup>3</sup> to below 80 MHz in order to protect Band II services. Many Band II receivers have inadequate out of band response performance to protect against PLC in nearby bands. Similarly Aeronautical services in the VHF band need protection. There is nothing that receivers(broadcasting, aeronautical, etc) can do to reject in-band interference from PLC and little that can be done to existing receivers to reject adjacent channel PLC.
- There have been some reports of PLC interfering with DAB (in Band III) services; however products operating in the VHF spectrum are at present limited – possibly by the desire for them to be marketable in the USA. Nevertheless it is important to ensure that DAB services are adequately protected.
- As PLC is not a licensable service, research is ongoing into its use at ever higher frequencies. One such study is reported to be using up to 2.5 GHz. The UHF spectrum is a vital part of modern communication systems, with services such as mobile, television broadcasting and Wi-Fi needing to be protected.
- The parallel routing of telecommunication and power cables also means that the uncontrolled use of PLC has the potential to interfere with the delivery of

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<sup>1</sup> WSC - World Standards Cooperation ([www.worldstandardscooperation.org](http://www.worldstandardscooperation.org))

<sup>2</sup> IEEE - Institute of Electrical and Electronics Engineers ([www.ieee.org](http://www.ieee.org))

<sup>3</sup> This is known as BPL (Broadband Power Line) in the USA.

conventional broadband telecommunications services. Whilst this may be outside the remit of the RSPG, it is essential that the overall use of the spectrum is addressed.

## **5. Conclusions**

There is a need for PLC networks that cannot readily be met by present wireless systems; however it is unlikely that the current PLC technology could comply with current interference standards. As these systems not only pose a threat all radiocommunication services operating in the bands where interference might be generated, there is a need to limit the use of PLC in a controlled manner. In discussing this issue the following three points need to be addressed:

- In order to ensure the most efficient usage of spectrum by radio services, the RSPG should identify what regulations are needed to prevent harmful incursion of unwanted emissions from non-radio systems disturbing radio services. Nominating the preferred spectrum for PLC use, together with limitations on its use is seen as a possible way to make progress.
- The impact of independent standards development such as in the IEEE needs to be assessed.
- PLC also has the potential to interfere with conventional broadband networks, hence the need for involvement with CEPT and/or the ITU-T is seen as essential.