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TV white spaces: approach to coexistence

Response from: Brian Copsey

In the many consultations from UK, CEPT and ITU that I have responded to since 1984 this is the most disappointing and disingenuous.

Both the Broadcasting and PMSE industry representatives have spent considerable time and expense in examining all the issues involved by the introduction of WSD in the broadcast bands, first in CEPT (producing three reports since 2009) and the WSD Cambridge trials. Even after these excellent balanced reports and practical trials they worked almost every week with a Technical Working Group (TWGs) chaired by Ofcom. However Ofcom has chosen to ignore some 90% of all this work and endangered both television viewers and the many users of PMSE operating in a wide range of industries including Broadcast, theatre and multimedia. Ofcom has ignored the facts and figures assembled in this work plus its own testing of PMSE equipment to arrive at a system which can only be described as “WSD must happen everywhere” at any cost to the general public and UK economy.

All involved in the work agree that there is “white space” which could be used by devices other than TV transmitters or PMSE, where we differ is the protection of incumbent licensed services and their users. Both Broadcast and PMSE appear in the ITU Radio Regulations and as such are “incumbent services” serving the general public and the UK economy (PMSE is a major contributor to a 38 billion pound industry).

In any previous introduction of license exempt short range devices (SRD) spectrum, it has been the SRD industries responsibility to prove they will not interfere with incumbent users. In the case of WSD this procedure has been totally reversed, *this is unreasonable*.

Another major issue is that whilst much statistical work has been carried out, the largest number of real WSD actually tested in live compatibility work (Cambridge Trial) is **3 prototype units**, and a single manufacturer’s (same manufacturer) neutered transmitter was used in the later Ofcom TV compatibility work. Therefore

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Ofcom is pressing ahead not with a “cautionary approach” but with a system which is designed to *absolutely* maximize the amount of white space spectrum in major conurbations at the expense of incumbent services.

TV reception: only protecting the main TV channel in an area, rather than had been discussed at the TWGs, also the secondary channel, this opens up the probability of interference to large numbers of viewers. In addition Ofcom have ignored the use of indoor aerials (both loft and set top) and amplifiers which at least some 33% of the public use plus at least some 20% using indoor aerials and amplifiers for second sets.

The maximum power of WSD will be some 4W, testing has shown these will generate interference to many amplified¹ systems, both individual household and communal systems. Much of this interference will be difficult if not impossible to cure, and of course at the public’s not the WSD cost

Unfortunately for Ofcom, the work prior to this consultation has shown that to fully protect PMSE use an exclusion zone of some 400m around a venue or event was necessary to prevent interference. In order to maximize white space spectrum availability Ofcom proposals are 14m and it would appear allow WSD into the actual venue.

We request that due to total lack of real life testing of WSD in reasonable numbers and the uncertain nature of the modulation schemes and applications to be used that Ofcom revert to the 400m exclusion zone around PMSE use. Until such time that sufficient WSD become available for testing to take place clearly identifying the reverse intermodulation issues first found in the Cambridge trials and use a realistic figure of -95 dBm for any protection calculations, not the -65 dBm resurrected from a document some 15 years old and in conflict with their own measurements plus their 3Gigbits of recordings from the Cambridge trial.

Within the documents the term “low Probability” of harmful interference is used. The Radio Regulations defines harmful interference as: *harmful interference: Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with Radio Regulations (CS).* The use of this term which if interpreted in a PMSE sense would

¹ The following report will be published shortly:

ICT Knowledge Transfer Network and Wireless Testing and Innovation Centre
Understanding DTT receive amplifier performance in the presence of LTE signals

decimate a live performance with the undefined term of “Low probability” does not give industry confidence that their proposals will protect PMSE use.

Current proposals talk about a PMSE event being able to be allocated new spectrum if interference occurs this beggars belief: first an event is expected to contact JFMG (does JFMG work 24 hours a day?) then recalculate an intermodulation free set of frequencies then find all the actors then retune say 40 radio microphones and filters whilst the audience wait?

All current proposals need to be reexamined with a view to real protection for TV viewers and PMSE users.

Fears of “jailbreaking” of WSD software have been dismissed by Ofcom, however the recent *REPORT ON THE 5TH JOINT CROSS-BORDER R&TTE MARKET SURVEILLANCE CAMPAIGN (2013)* WLAN 5 GHz shows the wide spread jailbreaking of the DFS mechanism causing severe interference to Radar. WSD software similarly modified would enable 4 watt continuous transmissions on any channel with no method of switching them off. In light of the ADCO report will Ofcom reconsider their approach and the security requirements of WSD devices?

To date no Impact Assessment appears to have been produced in spite of this being “*a key part of best practice policy making, which is reflected in our statutory duty to carry them out.*”

Two reports have been recently published by ICT Knowledge Transfer Network

- a. [DTT Receiver Protection Ratios with White Space Signals \(20Nov13\)](#)
- b. [White Space Signal Shaping innovation to improve DTT coexistence \(20Nov13\)](#)
- c.

These should be considered by Ofcom prior to any final decisions being made

In addition Ofcom have failed to answer what will happen to the White Space Industry when the 700MHz band is taken away for mobile use in a few years’ time when compacting of the remaining spectrum for broadcast and PMSE will result in very few if any channels available for WSD.