Response to the OFCOM Consultation on:

Assessment of the future mobile competition and proposals for the award of 800MHz and 2.6 GHz spectrum and related issues

From Brian Copsey

Introduction

The layout of the consultation document does not allow a reply which links a number of significant point pertinent to these “related issues”; I have therefore collected those related issues into one document for easier reading

Having been deeply involved in the issues surrounding the use of the Digital Dividend since 1997, I am extremely surprised at OFCOMS disingenuous presentation and its use of a misleading selective selection of information within this consultation on at least two levels.

1. The first is that whilst section 2.3 provides the financial benefits which may come from the new systems it totally omits to consider the cost to domestic viewers, communial aerial system owners and cable companies, nor does it consider the cost to Government (or mobile operators) of the provision of mitigation techniques and provision of filters to a large number of the population. And totally ignores the cost to Broadcasters of the second rearrangement of TV broadcast transmitters

No impact assessment of these issues has taken place in spite of many requests by Industry at both UK and EC level.

2. Whilst section 2.16 clearly states

This consultation does not cover the potential for mobile use of the 800 MHz band to cause interference to adjacent users, in particular Digital Terrestrial Television (DTT) or the means by which such interference might be mitigated. That will be covered in a separate consultation that we intend to publish. We will also publish a separate consultation setting out our proposals for the technical licence conditions that should apply to use of the 800 MHz and 2.6 GHz bands.

Any other consultation on the interference issues has yet to emerge but those replying to this consultation may well provide different answers if **all** the information where placed before them now!

Failure to provide transparency on all aspects of these awards is unreasonable to all parties concerned especially those considering biding for the 800MHz band

DETAIL from Consultation

Sections 4.23 to 4.27 give an extremely selective interpretation of only two of at least four arrears heavily impacted by these proposals, as OFCOM have taken an active part in both the European committees and also their own investigations prompted by those committees they cannot plead ignorance on the impact the interference primarily to domestic households on the successful deployment of new radio systems

To be clear the four main arrears are:

1. Domestic reception in a range of situations from those receiving Channel 60 to those with amplified aerials and indoor aerials
2. Communial aerial systems using high gain broadband amplifies and in many cases using the channels between 790-862MHz for additional locally injected programing or content
3. Cable networks who have used these channels for many years
4. Short Range Devices(SRD) are present in many households ranging from cordless headphones to remote curtain openers

A tremendous amount of work has taken place on these issues and two reports outline the findings, these are available at:

- https://ktn.innovateuk.org/c/document_library/get_file?p_l_id=737699&folderId=865485&name=DLFE-12451.pdf
- http://docbox.etsi.org/Etsi_Cenelec/PUBLIC%20FOLDER%20on%20DD/CENELEC-ETSI%20%20Joint%20Working%20Group%20Published%20reports/

The common link between 1, 2 and 3 are that the domestic equipment all use TV tuners, clearly identified as the prime point of interference reception in the reports

Specific answers to Questions

Before looking at sections 4. It is worth considering the importance of Q6.1, 6.2 and 7.3 as they may badly impact on the interference results shown in section 4:

Question 6.1: Do you have any comments on the proposal to include in one of the 800 MHz licences an obligation to serve by the end of 2017 an area in which 95% of the UK population lives, while providing a sustained downlink speed of 2Mbps with a 90% probability of indoor reception? Do you think there is another way of specifying a coverage obligation that would be preferable?

In order to achieve this penetration it is most likely that the transmit power recommendations of CEPT Report 30 and the EC decision will be breached with the result that interference impact to domestic viewing will be considerable worse than predicted in the various reports on the subject which have limited their research to the EC Decision and ECC Report 30 proposals

Question 6.2: We would welcome views and evidence on the costs and benefits of imposing an additional coverage obligation focussed on particular geographical areas, and if such an obligation were to be imposed what might be the appropriate specification of geographic areas?

To achieve such additional coverage the same problems identified in response to Q6.1above may well come into play

Question 7.3: We welcome views on the merits of the proposed approach to information provision; in particular concerning the type of information that may be helpful and any impacts that publication of information might have both on licence holders and the wider spectrum market.

A full and balanced approach to the impact of these proposals to all parties would greatly help the transparency of this process; there will be many losers as well as some winners.

Comments on information provided in sections 4.23 to 4.27

Short-range devices (SRDs) in 863 to 870 MHz

4.23 We are also investigating the possibility that mobile handsets in the 800 MHz band could cause interference to the SRDs that operate in the European harmonised band 863 – 870 MHz. We will set out our conclusions in relation to this issue in our subsequent consultation on the technical licence conditions relating to the 800 MHz band.

Many households use devices within these bands therefore it will be an additional interference burden, The CENELEC-ETSI Digital Dividend Joint Working Group (JWG) has already published work on this subject

4.24 Cable services, by definition, are not delivered by wireless but they can use frequencies up to and including frequencies in the 800 MHz band within the cabling and in set top boxes (STBs) and cable modems (i.e. customer premises equipment (CPE)). Interference into CPE may arise if a mobile handset operating in the top of the 800 MHz band (i.e. using frequencies 832 to 862 MHz) is used close to it

This misses the points clearly established in a wide range of testing and clearly stated in the JWG report that it is the TV tuner which is vulnerable, the same

devices are used for both domestic TV and STB. Also it does not mention that interference can also be caused by the base station.

Recent work has shown that the “idle” mode of LTE signal affects some TV and CPE more than the continuous artificial signals used within these tests

Many communial aerial systems also use the 800MHz band for a range of services which will remain after analogue switch off, some examples would be University Campus and Hotel systems, why was this subject excluded from the information provided?

4.25 During 2010 we worked with the Department for Business, Innovation and Skills (BIS), Virgin Media and technical consultants to understand the scale of the potential interference problem in the specific UK circumstances. We commissioned a series of practical tests on a Virgin Media cable network using independent consultants Cobham Technical Services (CTS). We published the results of their work on our website in December 2010[16]

Careful reading of this report gives a different interpretation than those provided in this consultation document

We commissioned a series of practical tests on a Virgin Media cable network, interesting that there were no results shown from the cable network testing

The Consultation document limits itself to only identifying SRD and Cable as potential victims of interference but communial aerial systems have been clearly identified as victims (as well as various form of domestic installation’s) and the only work published to date is the JWG and Digital Knowledge Transfer Network (DKTN) reports. If interference issues where to be included within this consultation all victims should have been clearly identified and quantified

4.26 The main conclusion we have drawn from the report by CTS is that the potential interference is manageable. The reasons for this are, in summary, as follows.

- *Eight of the nine STBs that CTS tested demonstrated good shielding properties from the simulated LTE user equipment at a distance of one metre; the one STB that performed badly represents a small proportion of the user base and is one of the older STBs. More resilient STBs are already available on the market and Virgin Media could either adopt them in its equipment replacement cycle or confine standard definition services to below channel 66 and continue to use there the older model STB (and any others like it).*

The report states: *"The results presented in this study for LTE UE interference into STBs at 1m separation distance suggest that the design of eight of these boxes should be adequate to meet the suggested limits when the STB are fed a good 64QAM signal. However 7 out of the 9 STBs tested could still suffer interference from a LTE UE handset operating at the maximum permissible transmit power of +25 dBm at 1m."*

Another interpretation of these results would be that 8 out of 9 STB's already meet the new immunity limits (please see section on ETSI CENELEC below), but 7 of these could still suffer interference from an LTE device operating at max transmit power and within 1m of the STB. It is interesting that the report does not identify the: *More resilient STBs are already available on the market*

Manageable?

And 8 out of 9 STB's would only demonstrate good shielding properties ***if fed with a good 64QAM signal***. This is because 64QAM needs 6dB less protection against interference than a 256QAM signal. This area is also addressed in the JWG work and the result of reducing networks to 64QAM is that the capacity of the network is reduced by 30% or it requires 30%more spectrum which would preclude isolating the 790-862MHz band as suggested by OFCOM

• *CTS's testing was on the basis of one metre separation between the CPE and handset, with handsets operating at the maximum permissible transmit power (of 23 dBm plus a further 2 dB allowance for environmental factors and production tolerances) and the wanted cable TV signal at close to the minimum acceptable level. There are several points to note. o A more realistic separation distance of about two metres would significantly lower the potential for interference.*

The issue of separation distance has been widely discussed and has been addressed by a range of testing reports collected by the JWG a range of results show that even with a two or three metre separation distance the victim may well suffer picture loss from devices in the same room or adjacent premises

o Mobile handsets will not generally operate at full power, which again reduces the interference potential.

This will depend on the efficiency of the aerial and physical location of the device; a dongle operated indoors away from a window may well be operating at full power whilst being adjacent to a domestic installation. Or if fixed mobiles are allowed, any equipment in the transmission beam

In addition LTE Base Stations could be co-located on high buildings with communial aerial systems which will likely give problems to all users of that system and any adjacent buildings.

o If, rather than operating the STBs at close to the minimum recommended level of wanted signal, the level had been increased to the median of the normal operating range all eight of the STBs would have been immune to video interference from a handset operating at full power at a distance of about one metre or less.

But again at 64 QAM with the disadvantages mentioned above, also from information provided to the JWG all network operators provide a level of signal(at 64 or 256QAM) which is in the upper 50% of the STD operating range none operate *at close to the minimum recommended level*

- *If, nonetheless, interference did arise as a result of handsets being operated within about two metres of a STB users would quickly identify the need to move away to avoid interference. Users might also be advised of the potential problem and this simple avoiding action.*

Again this does not take into account of interference generated in adjacent rooms and properties nor the possible of "idle mode" interference from an unused mobile within range of the domestic installation.

- *ETSI and CENELEC (the European standards bodies responsible for ensuring that consumer electronics are of a suitable standard) have proposed new immunity limits under which future cable CPE would need to be immune to interference from a mobile handset operating at full power from a distance of three metres. This limit is already achieved by a number of Virgin Media's existing STBs and should be readily achievable by new STBs and cable modems. Eight of the STBs and one of the cable modems tested - under the conditions tested - already meet the proposed immunity limit.*

  It is interesting to note the contradiction between the statement above with OFCOM'S opposition to the figures in the JWG report and proposed changes in EN 55020 "as not solving the interference problem". In fact in OFCOMS results: *7 of the 9 STB's tested could still suffer from interference*.

  Any new immunity proposals will only affect new equipment as and when it comes to market, it will not affect the installed user base of equipment. Whilst we can argue about the exact number and type of TV's a conservative estimate of some 26million households with two per household give a significant number of potential victims

- *Cable modems proved more susceptible to interference than the STBs; only one of the 12 tested performed well. However, Virgin Media does not provide any broadband services in the 800 MHz range at present and we consider that it could maintain this arrangement, avoiding use of broadband services in the top 40 MHz of the band and with it the potential for interference into cable modems.*

This means that any other service provided in this band would suffer interference,

4.27 Given that any significant deployment of two-way mobile services in the 800 MHz band is unlikely to occur before mid-2013 in the UK, we believe there is time to manage this issue. Virgin Media, and other cable operators, could do this by a combination of careful management of their frequency plans, replacement (if necessary) of older equipment with more resilient new equipment and basic information to customers on how to avoid interference when using LTE handsets.

As there are no new immunity standards or regulation in place at present for STB, Modems or communial aerial amplifiers:

- and it is unlikely that any will be in place before 2012

- and OFCOM does not believe the proposed changes in EN 55020 would solve the interference problem

- and getting immune equipment onto the market and installing it will take a minimum of 18-24 months

There is insufficient time for any major change in the installed base of equipment

Information to customers: surely the viewer will be the victim and the mobile handset provider should make this abundantly clear in their customer information?