"Working for quality and diversity in British broadcasting"

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Response from the Voice of the Listener & Viewer to Ofcom's Consultation on

TV white spaces: approach to coexistence

13 December 2013

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T A B L E O F C O N T E N T S

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The Voice of the Listener & Viewer (VLV) is an independent, non-profit-making membership association, free from political, commercial and sectarian affiliations, working for quality and diversity in British broadcasting content. VLV represents the interests of listeners and viewers as citizens and consumers across the full range of broadcasting issues. VLV is concerned with the structures, regulation, funding and institutions that underpin the British broadcasting system. VLV is a charitable company limited by guarantee.

For 30 years VLV has played a unique role in keeping a citizen's eye on major legislative proposals and action taken by regulators and broadcasters, enabling the voice of consumers to be heard, independently from the interests of political parties, industry players and other pressure groups.

Executive Summary

1 The protection of DTT/PSB and PMSE services from new WS services can be managed in a threefold manner:

- Firstly through adequately verified planning and regulated operating procedures and standards, notably concerning all WSDBs
- Secondly through a robust, pro-active, responsive and reliable maintenance regime that is alert to consumer reception problems and promptly deals with interference by moderating any offending WS transmissions
- Thirdly a robust conformance regime that assures all spectrum users that all WSDs available for sale perform to verified and approved standards.

2 The use of a licence exempt regulatory framework is of some concern; the market will depend on the supply and operational use of compliant equipment and practices consistent with the provisions of EN 301 598. It will be vital to ensure that this standard is thorough and much further work is required to achieve its confidence.

3 WS services are not the only potential cause of reception problems over the next few years, the effect of the 4G service roll out will also need monitoring and the cause of any given issue needs to be properly attributed.

4 DTT and PMSE licence fee payers need to be made fully aware of these developments so that they can take appropriate action in the event of any unexpected interruptions to their PSB services.

5 It is vital that there is a very robust management system in place at all stages of WS deployment from initial launch through to close monitoring that should include a highly visible and responsive consumer complaints process. This is the clear responsibility of Ofcom and we consider that Ofcom should provide adequate resources and funds to perform this task. This consultation takes insufficient account of this responsibility.

1 Response to Consultation

1.1 We welcome the opportunity to respond to Ofcom's consultation on the use of White Space Spectrum [WSS] in the DTT frequency bands.

1.2 We recognise and support the endeavour noted in Clause 2.13 of the consultation to make good use of the valuable and limited spectrum resource in the UHF bands but have concerns about the methods by which this may be achieved; these are outlined below.

1.3 We welcome the confirmation in Clauses 2.13 and 2.14 of Ofcom's approach to protecting the PSB services in those DTT bands where WS devices might be deployed. In particular, we welcome in principle the measured approach to deployment of WSDs, especially the inclusion of pilot trials prior to the award of any permanent services. However, we are concerned about the short timescales proposed and that too cursory an evaluation of the effects of WSDs may result in irreversible impairment of DTT and PMSE services to licence payers.

1.4 We also welcome the proposal in Clauses 2.18 to 2.21 to launch a widespread series of pilot transmissions to test the assumptions used in the modelling of WS services. Such a pilot is all the more necessary and valuable given that WS services are to be licence exempt implying less rigorous supervision of them.

1.5 We also welcome the publication of an impact assessment. However, given the prospect of the unprecedented sharing of spectrum between lightly regulated commercial services and public broadcasting it would have been expected that evaluation by means of a dedicated cost benefit analysis would have been appropriate. At the very least such a CBA should provide for example use cases and corresponding damage and the costs of mitigation, or not, in the light of the methods proposed.

1.6 We note the outline summary description in Section 3 of the background to spectrum usage in the UHF bands and the potential changes to it. The detailed technical annexe is welcomed and valuable in clarifying aspects of the actual process and criteria to be used in planning and implementing WS services and devices.

1.7 The technical analysis has taken account of some of the concerns expressed in this response and VLV acknowledges the experience and skill of spectrum planners.

However, our concerns arise because the deployment of WS spectrum adds to other recent activities, e g the present and future introduction of 4G services in the UHF, that place pressure on the scope and robustness of the DTT system and the PSB services it carries.

1.8 Further to comments in 1.3 and 1.4 above, we note the comments in Section 4 regarding the novelty of WS devices and services and the consequential lack of deep experience in their deployment. The many uncertainties in practical, economic and technical areas of this deployment require a cautious and adaptive approach in the light of experience. This lack of experience should require very close attention and rapid response to emerging difficulties. It should also require widespread pilot trials conducted over a sufficiently long period that relevant lessons are learned prior to the initiation of a full service.

1.9 The primary concern in managing WS devices and services is the obvious impact of interference on existing DTT and PMSE receivers designed for those services. Whilst it is assumed that all DTT receivers in use are designed to comply with DTT planning parameter values and to be operated in conditions consistent with planning rules, it cannot be guaranteed that all receivers currently providing consumers with PSB services will do so. This point is mentioned in Clauses 5.10 to 5.18 where it is made clear that certain reception installations are not catered for in the planning of the DTT service.

1.10 In particular, the use of second and third receivers in homes is widespread and many of these are not connected to an external aerial and operate in marginal conditions and so are vulnerable to interference. In some cases, e g rented flats, the main receiver has no external aerial. Only small amounts of interference could impair or even block reception in these cases. Whatever the remarks of 5.10 to 5.18 may say the public have adopted the use of unplanned installations in good faith because in many places a very satisfactory service is available by this means. It is however possible that with judicious setting of interference levels many of these installations will continue to work [see 1.17 below]. Those licence fee payers that are adversely affected will not take kindly to the impairment or removal of that service and the cost incurred in finding a remedy.

1.11 Thus, whilst a *"caveat emptor"* approach to consumer buying decisions may be valid and reasonable in general terms, always assuming that the public have been adequately informed and warned about less than suitable installations, the widespread use of marginally compliant installations cannot be ignored or excluded without due care and so the levels of interference considered acceptable need to be defined very carefully. In addition to the use of internal aerials many installations use amplifiers in the aerial feed either to boost the signal or to provide a feed to more than one receiver. This is also the case in communal aerial installations for blocks flats etc. The linearity of these amplifier systems is of concern because it will contribute distortion products when WSD transmissions are added to the wanted DTT signals. In some areas local conservation rules prevent the use of external aerials.

1.12 As an example, the use of a WS device for local WiFi in a given home may adversely affect a close neighbour's second or third set that does not have the protection of an external aerial that will provide a stronger signal than a set top aerial and will have better directional properties. Indeed it is also possible that even with an external aerial a WSD transmission will enter a receiver at high level and cause loss of service.

1.13 We note the comments in Clauses 5.19 to 5.21 that some consumers, even those with external aerials, may need to change their source of service in some cases by changing their aerials or having them re-directed. This assumes that those consumers can diagnose reception problems, realise that WSDs may be involved and then know what remedies are available. It is essential that consumers are made aware of risks and also helped to find those remedies. The worst aspect of WSD interference is its intermittence No part of the cost of this should fall upon those consumers.

1.14 Those receivers that have been tested and awarded a Switchover Tick Mark will be expected to be compliant but not all operating environments can be assumed to be under the reasonable control of a consumer, eg locations near the edge of planned service areas.

1.15 Furthermore, the testing regime for the Tick does not necessarily test protection ratios from interfering signals on distantly spaced UHF channels. The implementation issues with receiver "front-ends" using Silicon technology are documented. Such receivers have and will pass DTT-acceptability tests but will fail regarding the selectivity performance WSD schemes are assuming. These sets are purchased in good faith by licence-payers and are in increasing use. Their existence must be accepted and afforded protection.

1.16 In the light of the comments in Section 4, and given that a licence exempt regime is to be used, it is vital that there is a very robust management system in place at all stages of WS deployment from initial launch through to close monitoring that should include a highly visible and responsive consumer complaints process. This is the clear responsibility of Ofcom and we consider that Ofcom should provide adequate resources and funds to perform this task. This consultation takes insufficient account of this responsibility.

Whilst licence exempt WSD services might seem desirable, the impact on other licensees in the same spectrum must be respected and so a small registration fee payable by manufacturers and/or suppliers for each device that will use shared spectrum would not only be a reminder of their responsibilities for compliance with specifications but also to other spectrum users. These fees will contribute to the cost of policing.

1.17 In the light of Clauses 5.23 to 5.40 the suggestion of a 1dB degradation to the operating margin of a compliant DTT receiver seems reasonable, at least until that level can be confirmed as valid. Even at the edge of service area this is actually small compared to the dynamic variations in the received signal strength which would cause the service area contour to move dynamically. However this 1 dB is a

"one size fits all" statistical measure and as such is a guide at best. The variables involved in estimating levels of interference are wide; in setting a limit therefore a worst case assumption has to be made and so the protection afforded by an external aerial is minimal in practice because the WSD could be located directly in front of the aerial and across the street.

1.18 It is assumed here that the 1dB increase in interference plus noise at a given receiver is the total of all WS devices operating in the locality across all WS channels. Figure 8 illustrates a potential situation in London where the upper part of the UHF is occupied by many WSDs and there are interleaved devices at lower powers among the DTT channels. The receiver "front end" will accept all these transmissions and each one will contribute to the interference load. It may well be that this total power is dominated by one or more devices in the locality. We note the comments in the Technical Report, Clauses 3.39 *et seq*, concerning this issue.

1.19 In response to the question posed in Clause 5.40 we welcome cautiously the approach described because the arguments put forward for it seem logical and well founded. The proposal to avoid defining categorisation for protection ratio levels in the pilot trials is probably wise.

1.20 WS services and devices may be deployed in many different situations from static and permanent to mobile/portable and transient, as implied by the examples in Clause 5.43 and Table 1. Each poses different constraints and so a range of planning criteria will need to be established to manage them.

When a WSD device begins transmission, consumers will suddenly be faced with a potentially degraded DTT service for no apparent reason and will not necessarily be aware that a WS device, or indeed several such devices, has/have been introduced in the locality. This confusion will be all the greater because complete multiplexes comprised of many services are affected when polluted by interference and selecting another service in those same multiplexes will not provide any improvement.

We reiterate our deep concerns that the very nature of the proposed use of WSDs is covert as far as DTT licensees are concerned and so a robust policing process MUST be in place. It must be clear beyond reasonable doubt that ALL WSDs that claim to be compliant ARE compliant and that the specifications that underlie compliance are sound.

1.21 It is noted that the availability of WSS is not uniform throughout the UK. The reasons for this have been made clear.

1.22 It is assumed here, mainly because it is not made explicit elsewhere although a footnote 9 to Clause 3.39 of the Technical Report refers to the possibility, that all of the 8 MHz in each WS channel will be available to and used by a given WSS user. It seems possible that this 8 MHz of spectrum will be divided and shared in an FDMA manner among more than one user. It would be useful if this were to be clarified.

1.23 The remarks of Section 6 regarding PMSE services are noted and seem reasonable. PMSE is a vital part of TV programme production as well as many other uses eg high profile public concerts and Party Political conferences. It is vital that it is also protected from WS transmissions in an appropriate manner.

1.24 The remarks of Section 7 are noted. VLV is primarily concerned with the impact of WS devices on DTT and PSB services and so we do not offer substantial commentary on the content of this section. We expect that those organisations, having interests in the services mentioned, will represent those interests themselves.

1.25 Clearly the factors covered in Section 7, specifically Clauses 7.25 To 7.36, imply that some impact of WS services in other countries will be felt in those parts of the UK that are close to those countries. It is expected therefore that a reciprocal cross border planning approach will be used and adhered to in those other countries.

2 Response to Questions

2.1 Question 1: Do you have any comments on our proposed approach to ensuring a low probability of harmful interference to DTT services?

2.1.1 We are concerned that consumers without the assumed reception equipment – i e an external aerial – are being offered inadequate protection. Some consumers have no choice in their installations but nevertheless pay the full licence fee and are therefore entitled to protection. By assuming the strict planning rules WSDs are bound to have a degrading affect on reception.

2.1.2 There is inadequate treatment of the use of mast head and other in-line amplifiers used in reception systems.

2.1.3 The performance of certain types of receiver “front ends” is cause for concern in the presence of interference. This is a known feature and needs specific attention.

2.1.4 Whilst Ofcom assumes responsibility for database content relating to DTT this seems not to be the case for the management PMSE where interference is potentially more harmful and where calculations have to be made far more often in more complex environments. This is of some concern because it is a form of self regulation among players that will be inexperienced in these matters.

2.1.5 The nature of WSD interference is that it will be difficult, if not impossible, to trace and as such it presents a danger to other legitimate spectrum users and licensees. It will be variable and intermittent and only detectable by its effect on other services that use digital modulation schemes in adjacent spectrum. Consequently it will impair/prevent reception of complete DTT multiplexes, affecting all its services, not only one. This much more serious failure to protect licence payers has not been taken sufficiently into account in the analysis. The public should be made fully aware of the use of WSDs and the risks they pose.

2.1.6 There is insufficient treatment of the compliance questions raised by WSDs. An adequate conformance regime, including its policing, will add to regulatory costs but with no corresponding income from WSD licence fees. The funding and resourcing of conformance needs addressing more fully and openly than is the case in this consultation. The fact that one argument for WSDs is an economic one, any wealth generation from their use is inconsistent with no shared spectrum access fee or any contribution towards a conformance scheme.

2.2 **Question 2: Do you have any comments on our proposed approach to ensuring a low probability of harmful interference to PMSE services?**

2.2.1 We have no specific technical expertise in this area but recognise the importance of the use of PMSE spectrum in programme production. In common with other users of PMSE, some programmes are live events and so any interruption to them that WSDs may have will be immediately apparent with no prompt remedy. High profile events such as Party Political Conferences, charitable concerts distributed worldwide e g Live 8 etc, should not be exposed to such a risk for very obvious reasons and so the parameters used to control any WSD should be such as to guarantee no disruption. Theatres offer performances to the fee paying public and the potential loss to that public and to theatrical promoters is not trivial.

2.2.2 Insofar that a master database can control the operation of slave devices at a geographic location known to be occupied by a PMSE user, the parameters used must take account of the fact that a WSD could be located within a theatre or other PMSE location and close to PMSE microphone receivers. If that location is a temporary venue the WSDB MUST be aware of it.

2.2.3 The PMSE community operates a regulated and disciplined regime and pays fees to licence their use of spectrum. At the very least WSD operators should be made to respect that discipline with a reciprocal regime. It is of concern that whilst there is wide experience in the use of PMSE there is none for WSDs. The fact that one argument for WSDs is an economic one, any wealth generation from their use is inconsistent with no shared spectrum access fee or any contribution towards a conformance scheme.

2.3 **Question 3: Do you have any comments on our proposed approach to ensuring a low probability of harmful interference to 4G services above the UHF TV band? Please state your reasons for your comments.**

We would expect mutual respect among service providers and also respect in planning and specifying the associated technical parameters.

2.4 **Question 4: Do you have any comments on our proposed approach to ensuring a low probability of harmful interference to services below the UHF TV band? Please state your reasons for your comments.**

We would expect mutual respect among service providers and also respect in planning and specifying the associated technical parameters.

2.5 **Questions T1 – T19**

2.5.1 Question T1

We agree that a cap on WSD EIRPs is appropriate.

2.5 2 Questions T2 – T19

Our detailed technical expertise is limited and so we have no specific response to these questions but we offer the comments in Section 3 below. However, given the complexity of the planning environment described in the Technical Report and the novelty of WS services, we believe that the proposed pilots are vital to prove the assumptions being made before proceeding to a launch of commercial WS services.

Such pilots should be thorough and explore every feasible WS use scenario and all the provisions of the current draft of EN 301 598, so that the effect on both DTT AND PMSE can be evaluated. Indeed we would expect that the results of the pilots should inform the final version of the specification.

These pilots should also be fully open to public scrutiny. We would then expect that, following the establishment of WS initial planning rules, the benefit of any doubt or uncertainty during live WS service is given to DTT/PSB and PMSE.

3 Response to the Technical Report

3.1 Our response to the Technical Report issued with the consultation is limited primarily to the factors that affect DTT and specifically its PSB services i e Sections 2-4 and aspects of Section 8. The other areas, covered in Sections 5 to 8, are clearly very relevant and need to be analysed carefully and so it is gratifying to see that this is being done.

3.2 Section 2: High level framework

3.2.1 Whilst the WS devices are expected to be exempt from licensing they will have to meet certain specifications in order to function. These are not explicitly defined in this report but it is implied that the database system [see below] will provide parameter values to inform such basic regulatory specifications that apply and that all aspiring WS device manufacturers and operators will be fully aware of them.

3.2.2 We note the use of a maintained database that records the parameter sets available to any WS device wanting to open a service at a given location. We also note the procedure outlined in Clause 2.7 *et seq* and Figure 2.2.

3.2.3 We note the existence of EN 301 598 and that it is currently still in draft form. We expect that it will have passed through the rigorous process normally applied to such European Norms and so will have been proved in practice.

4

4.2 Section 3: Calculations

4.2.2 We note the content of this section that describes how a specific WS device request would be processed in order to produce a set of parameters suitable for use at its location. It is neither clear how secondary "slave" devices can be adequately controlled nor how mobile devices are to be treated i e devices in vehicles that may not be used in fixed locations.

4.2.3 We note that the EIRP allowed is limited both in total across the whole 8 MHz band as well as a density so that use of fractions of it can be accommodated.

4.2.4 We note the several different scenarios that classify and categorise WS devices as used for different purposes. Given that these purposes may well emerge once the technology is launched and that some may be explored during the pilot trial, then these categories and the specific procedures and calculations that support them should be subject to continual variation and amendment.

4.3 Section 4: Analysis

4.3.2 We note and appreciate the inclusion of this substantial Section that contains a detailed description of the UK spectrum Planning Model. This is very helpful in understanding how the UKPM is used to deal with introducing WS devices.

4.3.3 Given the specialist nature of this section we can offer no specific comment in detail.

4.3.4 It is clear from this section that the prediction of field strengths is not a simple matter and is dependent on sophisticated tools and propagation models that have developed over a number of decades. Some models are still dependent on empirical data and a certain amount of judicious selection of parameter values.

4.3.5 In addition occasional propagation anomalies that bring in high levels of distant and unwanted transmissions that are normally not high must be accounted for by assuming a percentage time factor.

4.3.6 Applying the planning rules to the WS case is more complex than the normal planning process for DTT itself where spectrum is allocated exclusively, the transmitter network is static and all sources are known and are of the same kind. WS devices may be located anywhere and transmit at varying EIRPs, although there is a proposed cap on any one transmission and may not be permanent. Our lack of detailed expertise does not allow us to respond to Question T1 although it seems wise in the circumstances to set a cap at some level.

4.3.7 The resultant confidence that can be placed in a predicted strength at a given location [a "location" is determined only to within a 100 x 100 metre square] is not perfect, due e g to local obstructions, and certainly not over time as the propagation conditions change, sometimes rapidly. Statistical models express that confidence by appending a variance to a given prediction. There is therefore a spread of field strength values and hence WS interference levels to be expected at any given DTT receiver. Those receivers may not all have equal tolerance to that interference. Whilst a 10% probability of exceeding a 1dB lift in interference may seem adequate, it remains to be seen from pilot trial results with a range of DTT receivers and WSD locations whether that is the case. The nature of WSD interference mechanisms is such that, at worst, a complete block on all DTT reception may result.

4.3.8 The most vulnerable of those DTT receivers are those near the service area boundary, where protection ratios are most challenged, or those near to a WS transmission device and also have good DTT signal strength thus loading the front end amplifier.

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Voice of the Listener & Viewer

BASIC DETAILS

Consultation title **TV white spaces: approach to coexistence**

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Name of respondent: Dinah Garrett

Representing (self or organisation/s): Voice of the Listener & Viewer

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	✓	Name/contact details/ job title	☐
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If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

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I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

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Name Dinah Garrett, Trustee Signed (if hard copy)

Trustee, Voice of the Listener & Viewer