



Digital Dividend Consultation

British Entertainment Industry Radio Group (BEIRG)

Response to consultation; 'Transforming the digital dividend opportunity into social benefits and economic growth in Europe'

Date: Wednesday 26th August 2009

Contact Details:

BEIRG Steering Committee
c/o Alun Rees, Ranelagh International Ltd
One Ranelagh Road
Westminster
London SW1V 3EX

Tel: 020 7828 1603

E-mail: beirg@ranelagh.info

Contents:

1. Introduction
2. Background
3. Analogue switch-off
4. Harmonization of the 800 MHz band
5. Single Frequency Networks
6. White spaces
7. Cognitive devices
8. Future development of wireless microphone applications and other secondary uses of UHF spectrum

1. Introduction

- 1.1. BEIRG is an independent, not-for-profit association that works for the benefit of all those who produce, show, distribute and ultimately consume content made using radio spectrum in the UK. Productions that depend on radio spectrum include TV, Film, Sport, Theatre, Music, Newsgathering, political and corporate events, and many others. In the context of the Digital Dividend (DD), BEIRG campaigns for the maintenance and certainty of Programme Making and Special Events (PMSE) access to spectrum that is interference-free and sufficient in terms of quality, bandwidth and continuity at reasonable prices. Without these guarantees, UK and EU-produced content that relies on the use of radio microphones and other short-range wireless devices will suffer, or indeed become impossible, at the very beginning of the value chain – where the audio portion of content is captured.

2. Background

- 2.1. On 10th July 2009 the European Commission published a consultation document on how to use the digital dividend opportunity to provide social benefits and utilise the DD to help foster the conditions needed for economic recovery in Europe.
- 2.2. BEIRG agrees that there are a number of potential opportunities that arise from the digital dividend being created by the process of Digital Switch Over (DSO). We also feel that as opportunities for some arise, it is important that they are not exploited to the detriment of other existing users of spectrum.
- 2.3. BEIRG are submitting this response in order to highlight the issues raised by the Commission's consultation and how they affect the PMSE industry. Perhaps more importantly BEIRG wish to highlight the result that negative, albeit unintended consequences would have for wider society. The PMSE industry would not suffer in isolation were some of the more damaging aspects of this consultation to be recommended by the Commission. The industry's activities cut across a broad swath of society, from small community groups, churches, schools and amateur dramatics to big-budget performing arts shows enjoyed by tens of thousands of EU citizens in situ and often millions more via television broadcasts. It is not just an industry that helps to entertain and enrich the Union's cultural life, but also one that informs by supporting external news gathering operations and providing the flexibility and quality of audio transmission that we have come to expect from our news channels. We would urge the Commission to consider our submission with this in mind.

3. Analogue switch-off

- 3.1. BEIRG believe that the Commission's proposal to strictly enforce a complete DSO date

of 1st January 2012 is unworkable. In the United Kingdom where plans for DSO are already well established, complete switchover is not scheduled to occur until late 2012.

- 3.2. In the UK PMSE users still have no workable alternative to those channels that they currently utilise for the operation of wireless microphones, in-ear monitors and talkback systems.
 - 3.2.1. Channel 69 (854 – 862 MHz) has been used by production companies, theatre groups, news gathering organisations and others for decades. It has provided clear, reliable and most importantly nationwide spectrum access for the PMSE sector. The industry has invested a great deal in procuring the equipment required to work in this channel.
 - 3.2.2. Whilst channel 38 (606 MHz – 614 MHz) has been identified as a replacement for channel 69 in the UK by the national regulator (Ofcom), it should be noted that as yet a funding package to aid the industry's involuntary transition has not yet been agreed. Nor is there nationwide coverage for channel 38. Despite efforts by the regulator there are still large exclusion blocks in operation around radio astronomy installations at Jodrell Bank and within Cambridgeshire. BEIRG also note that at the moment owing to the regulators need to continue protecting radio astronomy services until they vacate channel 38 the pattern of availability varies widely throughout the UK depending on whether use of equipment is indoor or outdoor.
 - 3.2.2.1. In effect the lack of nationwide access to channel 38 is prohibiting the industry's transfer to it, because it would mean having to carry two sets of equipment in order to provide nationwide service and involve significant capital outlay, which is beyond the means of many users.
 - 3.2.3. Furthermore, the UK industry faces additional problems caused both by the regulator's timescale and the unique burden of having to provide additional support to a range of international and national customers when the UK hosts the 2012 Olympics.
- 3.3. The timescale suggested by the national regulator (Ofcom) for clearing PMSE from the DD spectrum would create major problems for the sector, including manufacturers who need time to develop new equipment, those who use its services, and also threaten the 'broadcastability' of the Olympics. In addition, it is difficult to envisage the new owners of the cleared spectrum wishing to deploy their services prior to the completion of DSO and hence the spectrum being available UK-wide. Consequently, BEIRG have lobbied hard to extend temporary PMSE access to the entirety of cleared spectrum (both 600 and 800 MHz bands) UK-wide until at least after the Olympics in 2012. This position was supported by the London Organising Committee for the Olympic Games (LOCOG) and the arguments backed-up by statements from T-Mobile, Vodafone, Orange and O2 in August 2008:
 - 3.3.1.1. Vodafone stated that 'The current proposed timing of summer 2009 for the auction of cleared spectrum is not realistic, nor is it necessary given that the spectrum will not be available for launch of mobile services until towards the end of 2012.'
 - 3.3.1.2. T-Mobile stated that 'Whilst Ofcom is correct that some areas of the UK will be switching off their analogue TV signal before 2012, the fact is that any nationwide operator or broadcaster would not consider offering a nationwide service until after London analogue TV signal is switched off in 2012, irrespective of the date of auction. Mass market equipment for mobile operators is unlikely to be available until 2012 at the earliest, and so there is little value in having access to this spectrum earlier than this date.'
 - 3.3.1.3. Orange stated that 'In any event, it is not clear why there is such a rush by

Ofcom to award the spectrum 'in the interests of citizens and consumers'. Without any equipment available, there can be no services. The spectrum will not be released in London until 2012, hence cannot be used until after this date.'

- 3.3.1.4. o2 stated that 'National access to spectrum would be needed by mobile network operators to deploy mobile broadband services'
- 3.3.2. In summary some of the major beneficiaries of the digital dividend, the mobile network operators (MNOs) saw no benefit in carrying out auctions for the spectrum freed up by the dividend in the summer of 2009.
- 3.4. The Commission's intentions to accelerate DSO and make it whole and complete by 1st January 2012 present a clear threat to disrupt the transition plans for regulators at a national level. Regulators like Ofcom who have laid out clear plans for the DSO transition, taking into account the UK's need to provide adequate PMSE spectral access in order to host an Olympics in 2012 that both the UK and the wider European community can be proud of.
- 3.5. BEIRG would urge the Commission not to be swayed by the exclusive interests of the MNOs and to take into consideration the damaging effect that mandating a complete DSO by 1st January 2012 would have on the PMSE sector.
- 3.6. In fact, BEIRG cannot see how the Commission would accommodate for those national regulators who have already made commitments regarding DSO during the course of 2012 within their jurisdictions. In the UK, Ofcom have already stated that;
- 3.6.1. 'we will maintain PMSE access to the rest of the 600 MHz band (channels 31-35 and 37) until DSO is completed in the UK in late 2012. New licensees' rights to use that spectrum will only begin at that point'¹;
- 3.6.2. 'we will maintain PMSE access to the 800 MHz band (including channel 69) until at least the date when protection for UK radio astronomy use of channel 38 ceases, currently scheduled for 1 January 2012'²;
- 3.6.3. 'Depending on the outcome of the Government-expedited work referred to above, it may yet be possible for PMSE access to the 800 MHz band to continue beyond 1 January 2012, up to the completion of DSO in late 2012 – three years after establishing a funding mechanism and three and a half years after confirming channel 38 as the replacement for channel 69. If not, we and the Government will need to consider how best to provide for an orderly migration. The Government's timetable for this aspect of Digital Britain suggests there should be clarity on the duration of PMSE access to the 800 MHz band (including channel 69) in September 2009. New licensees' rights to use the spectrum will begin at the point PMSE access ends'³
- 3.7. Following this and the Independent Spectrum Broker urging the UK Government to take 'all practical measures to expedite the clearance of the 800 MHz band', BEIRG are concerned that the ISB would be recommending to Government a direction to Ofcom to clear PMSE from the 800 MHz band by 1st January 2012 rather than later in 2012 after the Olympics. The reasons why PMSE needs to retain access to the cleared spectrum have not changed.
- 3.8. The Government stated in the Digital Britain Report that it 'is committed to the timely release of 800 MHz spectrum and will work with Ofcom to understand and meet the technical challenges. It has already endorsed Ofcom's proposal setting out plans to clear channels 61, 62 and 69. The Government will facilitate this re-planning and **will**

¹ <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf> section 5.71

² <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf> section 5.71

³ <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf> section 5.71

meet the costs incurred by broadcasters and PMSE users as a result of these changes⁴.

- 3.9. The vast majority of wireless microphones and in-ear monitors in the UK operate in the 800 MHz band. Ofcom have estimated that 95% of all wireless microphones in the UK are designed to tune to channel 69. In order to clear the 800 MHz band of PMSE, all the relevant equipment that operates in this band in the UK will need to be replaced or retuned. In order to continue providing valuable services, PMSE equipment-owners will need to replace or modify existing 800 MHz equipment with equipment that operates in the remaining (i.e. post-DSO) interleaved spectrum and/or channel 38. Demand for this new equipment and modification services will need to be met by manufacturers and other relevant parties. Ofcom have recognised that this process will take time and therefore proposed a migration period of three years⁵. The PMSE Pro User Group has stated that it would take longer than this; at least three years for development plus a further 7 years for market penetration⁶.
- 3.10. Aside from arguments about how much time is required to migrate PMSE users from the 800 MHz band in an orderly and efficient fashion, there are currently significant barriers to this process even getting underway. In order to meet the Government's commitment to the 'timely' release of the 800 MHz band, these barriers must be removed. Indeed, BEIRG cannot see how current arrangements will ensure either a timely or effective clearance of PMSE from the 800 MHz band. The following sections explain why and what should be done.
- 3.11. Ofcom proposed to clear channel 69 of PMSE and include it in the 800 MHz auctions rather than award it to the band manager with PMSE obligations in February this year. Ofcom has since announced that channel 38 will be cleared of radio astronomy and awarded to the band manager as a replacement and stated that 'users can therefore now begin to move from channel 69'⁷. However, due to the needs of significant groups of PMSE users, this is not the case; they cannot move from channel 69 because use of channel 38 is restricted.
- 3.12. Channel 38 is used for radio astronomy services centred in Jodrell Bank (Cheshire) and Cambridge. As a consequence of the requirement to protect radio astronomy from interference, channel 38 is unusable for PMSE in large areas of the North East, the Midlands and East Anglia. In addition, there are areas across the UK where channel 38 can only be used indoors in order to protect terrestrial TV from interference in neighbouring channel 37.
- 3.13. As a consequence of these severe restrictions on the usability of channel 38, all those who need their equipment to be useable UK-wide (mobile/travelling productions) or specifically in those restricted locations (fixed venue) have no option but to continue to use existing channel 69 equipment and if they need new equipment to invest in new channel 69 equipment. Ofcom have recognised this principle, as evidenced by their statement that users who may be eligible for funding will include those 'who need to purchase channel 69 equipment between the publication of this statement and 1 January 2012 (when channel 38 becomes available for PMSE use UK-wide) because their existing equipment is demonstrably in need of replacement and channel 38 equipment will demonstrably fail to meet compelling operational requirements.'⁸
- 3.14. Whilst Ofcom have said that they will engage with radio astronomy users to try and reduce the restrictions on PMSE use of channel 38, the current position is that radio astronomy use of channel 38 will continue until 1st January 2012. In addition, the

⁴ <http://www.culture.gov.uk/images/publications/digitalbritain-finalreport-jun09.pdf> page 78

⁵ <http://www.ofcom.org.uk/consult/condocs/800mhz/800mhz.pdf> question 15

⁶ <http://www.ofcom.org.uk/consult/condocs/pmse/responses/ProUserGroup.pdf> page 4

⁷ <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf> section 7.16

⁸ <http://www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf> section 5.112

restricted use of channel 38 to indoors only due to the need to protect television transmissions in adjacent channel 37 will remain until the digital switchover (DSO) is completed in each region, culminating in London in mid-2012.

- 3.15. The upshot of the current situation laid out above is that a large number of PMSE users of channel 69 **will not be able to migrate from channel 69 until DSO is complete**. These are, as stated above, UK-wide users (mobile/travelling productions) and fixed venue users in the affected areas.
- 3.16. UK-wide users/uses include:
- 3.16.1. Electronic News Gathering
 - 3.16.2. Broadcast audio
 - 3.16.3. Motion Picture audio
 - 3.16.4. Television audio
 - 3.16.5. Freelance sound recordists
 - 3.16.6. Conference producers and events companies
 - 3.16.7. Touring productions (e.g. theatre, musicals, live music)
- 3.17. Static users/uses include:
- 3.17.1. Churches and Places of Worship
 - 3.17.2. Charities and Community Centres
 - 3.17.3. Theatres and Auditoria
 - 3.17.4. Studios (film and television)
 - 3.17.5. Schools, Colleges and Universities
 - 3.17.6. Conference Centres
 - 3.17.7. Board Rooms and Businesses
 - 3.17.8. Pubs, Clubs and Bars
 - 3.17.9. Sports Arenas and Stadia
- 3.18. If the situation remains as is, with PMSE retaining access to the cleared spectrum (including channel 69) until 1st January 2012 only and channel 38 only clear of radio astronomy by this date, for all the affected users and owners of channel 69 equipment above, **the migration to channel 38 seems to be expected to take place overnight**. Quite simply, BEIRG does not see how this would be possible. Ofcom's position is that three years will be required for an orderly and efficient migration to take place and the PMSE Pro User Group considered that it would take longer.
- 3.19. One suggestion that has been put forward is that users start to build-up stocks of channel 38 equipment as soon as it has been developed and it is available from the manufacturers. However, this would require significant financial investment and hence the Government funding package secured and provided to those eligible as soon as possible. This would involve 100% funding, with no-write downs, since users could not afford to invest in equipment that they could not use. In the meantime, users would need to continue to use and, where necessary, buy channel 69 equipment up until the point at which channel 38 becomes available on the same basis. Therefore, guarantees would need to be provided to those who need to invest in channel 69 equipment, that they will receive funding to cover the replacement costs when it is rendered redundant. Presumably also, a mechanism would need to be put in place to ensure that channel 69 equipment is taken out of circulation by the point at which new owners of the 800 MHz band deploy their services.
- 3.20. Another major problem with the 'overnight migration' on 1st Jan 2012 is that, currently, the manufacturers who will be required to develop and supply channel 38 equipment (and modify existing equipment where possible) would not be able to start to recoup their R&D and production costs through sales until this date (or close to it) unless the actions outlined in section 3.9 above are taken. In absence of the actions taken in point 3.9 above or direct cash injections to manufacturers, manufacturers will find it

extremely difficult to produce sufficient channel 38 equipment to re-equip the industry. In the meantime, the lack of sales is likely to force some manufacturers out of business (particularly those who specialize in channel 69 equipment) and lead to job losses, just when the industry needs 'all hands on deck'.

3.20.1. The Commission's desire for a firm date of 1st January 2012 for DSO would create the conditions where manufacturers and users would indeed be subject to an overnight migration. The key points here are as follows;

3.20.1.1. Lack of a suitable alternative to the channels currently used for PMSE.

3.20.1.2. Scarcity of equipment and the forced nature of transitioning to alternative spectrum which demands that an adequate funding package be put in place to avoid major disruption to the PMSE sector with the inherently pejorative effects this would have on the cultural life of the UK and other European nations.

3.20.1.3. The requirement for the transition phase to start from the time at which there is a suitable like-for-like alternative available to the PMSE sector. As outlined above, radio astronomy restrictions mean that the alternative in the UK at least, i.e. channel 38 is an inferior substitute for the spectrum that is being taken away.

4. Harmonisation of the 800 MHz band

4.1. Whilst harmonisation of the 800 MHz band is the unavoidable progenitor of the digital dividend, BEIRG would counsel against rapid harmonisation. The 800 MHz band must be available for PMSE use until at least 1st January 2012 throughout Europe, and in the UK until the Olympics have finished.

4.2. Rapid harmonisation of the 800 MHz band will threaten the viability of an industry, which in the UK alone, employs tens of thousands, and accounts for a sizable amount of national GDP. The UK is not alone in enjoying the benefits that arise from a vibrant PMSE community. Every European nation has a rich history of providing for the performing arts. Today, the quality of these productions is assured by access to reliable, clear and well managed spectrum.

4.2.1. It should be noted here, that the equipment used by the PMSE sector is not inexpensive, nor is it disposed of lightly. European manufacturers such as Sennheiser produce equipment for PMSE use which has a lifespan measured in decades not days. Investment in wireless microphones, IEMs and talkback systems is heavy and planned for the *long duree*. The Commission must be sensitive to the predicament that the PMSE industry throughout Europe would find itself in were they to recommend a more immediate date for the harmonisation of the 800 MHz band.

4.3. In order to ensure that the 800 MHz band is appealing to those who wish to make use of it for mobile broadband and other mobile services, the band must be cleared of all existing users before alternative use is made of it. This requires the provision of a funding package to ensure that PMSE users, who are being forced out of this area of spectrum, can make as smooth a transition as possible to the new arrangements being put in place for them.

4.4. We strongly believe that failing to put in place a mechanism to effectively migrate PMSE users from channels 61-68 with the sector having to bear the costs risks undermining the UK Government's and the Commission's commitment to the timely migration from the 800 MHz band.

4.5. In respect of channels 63-68, Ofcom has stated that the PMSE sector was provided with notice at the beginning of the Digital Dividend Review in the UK on 17th November 2005 that these frequencies were under threat. In respect of channels 61 and 62, Ofcom decided on 13th December 2007 that 'this spectrum would be removed from

PMSE use'. However, whilst Ofcom had announced that these frequencies would not be useable for PMSE, no certainty has been provided as to which frequencies in the post-DSO interleaved spectrum will be available for PMSE. Ofcom has provided general 'reassurances' about the overall availability of interleaved spectrum, but has not provided data which shows the definitive configuration of the post-DSO interleaved spectrum and will now not be able to do so until mid-2010 at the very earliest once the international negotiations for reorganization of DTT have completed. As a consequence of this lack of certainty, the PMSE sector has no option but to continue to manufacture and invest in equipment that operates in the spectrum due to be cleared of PMSE and has not been able to migrate into replacement bands.

- 4.6. Under current plans, migration of PMSE users from the interleaved spectrum in channels 61-68 into the post-DSO interleaved spectrum cannot possibly start until mid-2010. Even then, it is not clear that users will be able to migrate because the post-DSO interleaved frequencies may not be available in the locations where users wish to operate their equipment due to discrepancies in configuration between analogue and digital television transmissions and channels 21-30 and 41-60 will still be used for analogue TV up until the point where DSO takes place in each region.
- 4.7. For example, a PMSE user in a particular location may wish to buy new equipment from mid-2012. Ofcom's 'white space' maps would show which frequencies will be available in that location after DSO is completed. However, it may well be that those frequencies do not become available until DSO has taken place. As DSO is being phased-in gradually, the vast majority of the UK will not have switched-over by mid-2010 and so the migration of PMSE users from channels 61-68 will be delayed in each region until DSO has taken place. Again, this culminates in London in 2012.
 - 4.7.1. We refer back to paragraph 3.2.5.2 where we stated our concern that the Commission's proposals, contained in the consultation, do not provide any accommodation for those EU member states where DSO switchover is planned and is currently being executed according to agreements that pre-date the Commission's sudden interest in bringing about complete DSO on 1st January 2012.
- 4.8. Points 4.4 to 4.6 above demonstrate why the production of equipment designed to exploit the post-DSO interleaved spectrum cannot start until certainty is provided in mid-2010 and it is highly questionable whether and to what extent migration from channels 61-68 will be able to start at that point. As per the transition time required for migration from channel 69, we expect it to take at least three years for the PMSE sector to migrate from channels 61-68.
- 4.9. Therefore, as per the arguments relating to channel 69, the Commission, national Government and regulators will need to take measures to ensure that PMSE users can move out of channels 61-68 in an efficient and orderly manner so the spectrum is clear for sale and interference-free for use by new services.
 - 4.9.1. Firstly, those who own equipment that operates in channels 61-68 must be eligible for funding to replace their existing equipment and that which they need to buy up to the point at which equipment that operates in the post-DSO interleaved spectrum is available and useable. We would expect that this mechanism would make it easier to, once new equipment is available, remove equipment from the market that operates in the spectrum due to be cleared.
 - 4.9.2. Secondly, the PMSE sector needs to retain access to the interleaved spectrum in channels 31-37 and 61-69 until at least 1st January 2013 and probably until 1st January 2015.
 - 4.9.3. Thirdly, the Commission, in conjunction with national regulators must provide clarity on the interleaved frequencies that will be available for PMSE post-DSO.

- 4.10. The Commission should also take into account the inconvenient truth that the vast majority of PMSE users of the DDR spectrum deploy their equipment on an unlicensed basis, albeit this is not a concern in France where unlicensed use is the norm. As repeatedly stated, BEIRG does not in any way condone unlicensed usage. However, the fact that these users/equipment owners will not be entitled to financial assistance increases the risk that the equipment will remain in the marketplace with the potential to interfere with new services if used because it cannot be tracked and removed/destroyed. We therefore suggest that this could be an issue, particularly if any guarantees regarding the 'purity' of the spectrum to be sold will need to be provided to potential new licensees/bidders prior to the auctions
- 4.11. In the UK it is especially important that the interleaved spectrum remain available throughout 2012 as the pool of PMSE equipment held for use in London will alone be too small to cater for the requirements of the Olympics. Therefore, a large quantity of additional equipment, which is currently held for use in regions outside London, will be required. However, the additional equipment currently held for use outside London is unlikely to be available because it will have been rendered redundant (and disposed of and replaced) or modified.
- 4.12. The size of the potential pool of equipment available for production of the Olympics will be reduced the earlier that PMSE users are prevented from operating in the cleared spectrum. Conversely, the longer Ofcom permit PMSE users to retain access to the cleared spectrum across the UK, the larger the potential pool of equipment will be. Therefore, Ofcom must allow the PMSE sector to retain certainty of access to the entire cleared spectrum UK-wide until September 2012 at the earliest to ensure sufficient equipment availability for the production and broadcasting of the London Olympics.
- 4.13. Ofcom has stated that '*accommodating a peak of 350 wireless microphones and 100 IEMs at the Olympic Park would require an average of 11 to be supported in each available channel*'⁹. More accurately, if 40 channels were fully available then 11.25 wireless microphones and IEMs would need to be accommodated in each individual channel. We believe that this is extremely optimistic and doubt that it is possible. If the digital dividend spectrum is not available (i.e. only channels 27 and 38-60 is) then nearly 19 wireless microphones and in-ear monitors will need to be accommodated within each individual channel. We do not believe that this would be possible.
- 4.14. Ofcom has stated that '*we understand that 16 microphones per channel are routinely realised by some UK users, while a maximum of 23 microphones per channel was achieved during the London stages of the 2007 Tour de France*'¹⁰. It is not clear where Ofcom got this information from¹¹, what evidence there is to support it, the specifications of the equipment used, the proximity of users and the environment. BEIRG is extremely surprised by these figures and do not believe that it is realistic to extrapolate these to apply to Olympic Events. From the industry's experience only around 8 wireless microphones would typically fit into an 8 MHz TV band¹² (particularly for professional productions) at the same venue, with around 12 as a maximum.
- 4.15. A report from one of Ofcom's consultants, CSMG, states that '*Digital equipment manufacturers claim that, for an isolated 8 MHz TV channel, digital wireless microphones can accommodate 10-16 transmitters (compared to a typical range of 8-12 for analogue systems*'¹³. However, in practice it is not clear that these 'efficiencies' are realised. It is understood from JFMG data that one West End production using

⁹ <http://www.ofcom.org.uk/consult/condocs/london2012/london2012.pdf> section 6.10

¹⁰ <http://www.ofcom.org.uk/consult/condocs/london2012/london2012.pdf> section 6.10

¹¹ We presume that Ofcom would use the JFMG licensing database to confirm that 16 microphones are 'routinely' realised in a single channel and 23 microphones per channel was achieved during the Tour de France. If this is the case then we would welcome confirmation.

¹² <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/beirg.pdf> section 1.3

¹³ <http://www.ofcom.org.uk/radiocomms/ddr/documents/wirelessmics.pdf> page 40

digital equipment in a theatrical show employs 32 digital wireless transmitters using a total of 40 MHz of spectrum¹⁴. This is less than 7 wireless microphones per channel.

- 4.15.1. In order to better understand the impact that reducing the spectrum available for PMSE use would have on the provision of service to broadcasters and other users at the Olympics in 2012 we are enclosing our formal response to Ofcom on this issue.
- 4.16. The equipment availability problem will be exacerbated by the following;
- 4.16.1. LOCOG's technology freeze in 2010
- 4.16.2. The fact that it is still unknown which frequencies in the digital interleaved will be available for the PMSE sector at the time of the Games. Indeed, due to the timing of the second and third phase auctions of the geographical interleaved spectrum, it appears that the amount of interleaved spectrum auctioned and subsequently, what is left for PMSE, may not be fully realised until early 2010.
- 4.17. The required equipment cannot be made unless manufacturers know what spectrum will be available. If LOCOG's technology freeze functions as anticipated (i.e. no equipment can be used for production and broadcasting of the Olympics unless its performance is proven by the beginning of 2010) then little or no equipment that operates in the digital interleaved will be useable for the Olympics because it will not have been manufactured until after available frequencies in the digital interleaved have been established in 2010.
- 4.18. It might be argued that since Ofcom made the decision to allow temporary PMSE use of channels 63-68, with a notice period of six months, the PMSE sector would have access to the cleared spectrum outside London until after the 2012 Games. However, under Ofcom's current plans this would not be the case; they have only agreed to allow temporary PMSE use of channels 63-68 in the regions where DSO will take place before the end of 2009.
- 4.19. Ofcom have suggested they could acquire spectrum temporarily to solve the spectrum availability issue. However, even if Ofcom did so, the security of tenure for the PMSE sector in that newly acquired spectrum would be of such a short duration that it would not be commercially viable to develop and manufacture the corresponding equipment (as it would become redundant as soon as the Games were over). Indeed, in relation to the cleared spectrum, Ofcom have stated that 'if licensees are to have a reasonable prospect of earning a commercial return on their investments they will therefore need a reasonable degree of certainty that they will be able to continue offering service through to around 2027'¹⁵. The same issue of commercial viability applies to the PMSE sector.
- 4.20. Taking DSO as a fact and the PMSE transition from accessing 'analogue' interleaved to 'digital' interleaved, the PMSE sector must retain access to the cleared spectrum across the UK to retain the largest pool of equipment available for the 2012 Olympics.
- 4.21. BEIRG is also concerned that further geographic interleaved channels may be included in future awards at both a national level and across the EU in accordance with 'expressions of demand'. This will further increase uncertainty for the PMSE sector. As long as the potential exists for further reductions in interleaved spectrum to be available for PMSE post-DSO, PMSE equipment that has been specifically future-proofed to operate in the digital interleaved spectrum may still be rendered redundant or require modification. Indeed, in the UK, Ofcom state that 'it may be necessary, when considering which lots are offered to market, to amend or reconsider the channel offered from a particular transmission site in order to optimise possible outcomes.'¹⁶ This is a further reason why the PMSE sector must retain access to the cleared

¹⁴ <http://www.ofcom.org.uk/radiocomms/ddr/documents/wirelessmics.pdf> page 40

¹⁵ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/statement.pdf> Section 6.56

¹⁶ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/interleaved.pdf> section 6.21

spectrum until all geographic interleaved awards are complete¹⁷, no further awards will take place, all relevant services are deployed and national regulators can prove that the remaining interleaved spectrum and channel 38 are sufficient to cater for current and anticipated levels of PMSE demand post-DSO.

5. Single Frequency Networks

- 5.1. Simply put, the development of Single Frequency Networks for television transmissions would mean the annihilation of the interleaved spectrum. This is because the technical implementation of SFNs involves transmitting a TV broadcast signal at the same time, on the same frequency using an SFN adapter to modify the transmission stream. This would result in the removal of the interleaved spectrum, which would destroy the PMSE industry, leading to widespread job losses, technical retardation and cultural retrenchment if the PMSE sector was evicted from its spectrum bands once again so the cleared spectrum could be sold via auction. If SFNs are to be used for television transmissions and the PMSE sector displaced, EU or national Governments must pay the entire cost to the PMSE sector of the relocation and also ensure that a sufficient number of cleared channels available nationwide or EU-wide are reserved for PMSE to the extent that current and future demand for these services can be met.
- 5.2. If the Commission is minded to allow development of SFNs throughout the EU then there will be a concurrent need to provide for greater PMSE-dedicated spectrum elsewhere in the UHF bands. This could be achieved through protecting channel 38, as envisaged in the UK as a PMSE only channel with further security of access for PMSE in an additional 15-20 cleared 8 MHz TV bands throughout the EU.
- 5.3. Alternatively, if the Commission decides that SFNs should be permitted but limited to the channels involved in the Digital Dividend i.e. channels 61 – 69 (790 MHz – 862 MHz) then PMSE should have its current access to the interleaved spectrum replicated by a guaranteed right of primary access to all interleaved spectrum EU-wide in the UHF channels that will be used for TV broadcasting post-DSO. The international harmonisation of spectrum for PMSE use will bring significant benefits to the millions of users in the form of economies of scale for equipment production and increase efficiencies in the downstream market. Not only this, but it will bring substantial benefits to international touring productions and other users such as newsgathering that require flexibility because they will not need to swap equipment as they move from country to country, with all the associated costs.
- 5.4. If SFNs are to be introduced in any form either preceding or following DSO then the Commission must recognise that without offering additional spectrum access either on a primary or secondary basis, such an innovation would represent a substantial reduction in the amount of spectrum available for PMSE use.
- 5.5. In addition, any such reduction in spectrum available for PMSE is not justifiable because the industry has shown year-on-year growth and increase in spectrum demand throughout the EU. It is not just that demand for big budget stage shows or musical concerts continues to increase, but that an ever more matured awareness of the role that community relations play in the achievement of positive social outcomes means that people are coming together in order to conduct activities or enjoy cultural events. These invariably rely on the ability to project the human voice, whether it is a local community group running an auction to a Joss Stone concert at the O2 arena.
 - 5.5.1. A study commissioned by the DDR from Sagentia forecast year-on-year increases of 30% in the demand for PMSE amongst community organisations, and 12% in demand from small-scale commercial organisations. The take-up of PMSE equipment for both uses was forecast to increase by 25% between 2006 and 2009, and 15%

¹⁷ Assuming they take place; BEIRG believes that they should not

between 2010 and 2012¹⁸. Demand is expected to grow over the next 20 years¹⁹. For many productions, there are simply no alternatives to use of these technologies.

5.5.2. For example, typical use in major theatres is in the range of 50-100 indoor radio microphones, plus some talkback and IEM²⁰. Where analogue microphones are used, they are generally used at 8–12 per TV channel; thus this use may require 10 or more TV channels. Provincial theatres have correspondingly lower usage; typically 3 channels are used to accommodate up to 30 Microphones. The spectral demands of touring musicals or theatre productions, rock and pop and other concerts are similar to those of West End theatres. A typical touring band would use an average of 30-40 radio microphones, although, according to the Sagentia Report²¹, one high-profile touring show used around 100 radio microphones. At the other end of the scale, as the Sagentia Report states, ‘social users have predominantly low usage, i.e. an average of 4 radio microphones within 1 TV channel (Ch 69) at locations spread throughout the UK’²².

5.5.3. The UK Government recently allocated over £50m in order to tackle the problems of isolation in a bid to improve community cohesion and bring people together²³. Put simply, the PMSE sector has a much more immediate and meaningful impact on the problem of community atomisation than would be realised through the provision of more television channels or networks²⁴. This is because the activities that rely heavily on the PMSE industry are those that bring people together whether through performance art, public meetings, discussion forums, carnivals and the like. They are inherently activities that encourage contact with our fellow man and discourage the sort of isolationism that private consumption of media and entertainment fosters.

6. White spaces

- 6.1. The interleaved spectrum is located within UHF (Ultra-High Frequency) bands IV and V, which comprises frequencies 470-862 MHz.
- 6.2. The 470-862 MHz band is split up into 49 ‘TV channels’ of 8 MHz starting at ‘channel 21’ and going up to ‘channel 69’. Channels 21-35, 37 and 39-68 are currently used for broadcasting television (TV) transmissions, which is the primary user. For technical reasons, in any given location only some of the frequencies reserved for TV broadcasting are used for this purpose. The unused frequencies are known as the interleaved spectrum, which PMSE is permitted to use provided it does not cause interference to TV broadcasts.
- 6.3. Professional and community PMSE users alike, from broadcasters, commercial theatres and event organisers to churches, pubs and schools, use the interleaved spectrum because this is where the equipment in which they have invested operates. There are very good historical and technical reasons for this, for example that the equipment is built to operate in the interleaved spectrum because in the UK it lies adjacent to channel 69, which is the only nationwide channel dedicated for PMSE use. The interleaved spectrum provides much essential additional bandwidth adjacent to this. If there was more PMSE-dedicated spectrum elsewhere, the pressure on the interleaved spectrum would be lessened.

¹⁸ http://www.ofcom.org.uk/consult/condocs/ddr/ddr_annexed.pdf A8.30

¹⁹ <http://www.ofcom.org.uk/research/technology/research/sectorstudies/entertainment/entertain2028.pdf>
section 7.2

²⁰ As corroborated by the Sagentia Report

²¹ http://www.ofcom.org.uk/consult/condocs/ddr/reports/report_sagentia.pdf

²² http://www.ofcom.org.uk/consult/condocs/ddr/reports/report_sagentia.pdf

²³ <http://www.communities.gov.uk/communities/racecohesionfaith/communitycohesion/>

²⁴ <http://www.communities.gov.uk/documents/communities/pdf/1303560.pdf>

- 6.4. This year, Ofcom published an Independent Report by CSMG on the potential for more efficient use of spectrum by wireless microphones. The 'key implication' of the analysis was that 'UHF bands IV and V spectrum will remain critical to many PMSE users (fixed-venue and touring performances, concerts and events, studio-based programme making, complex ENG/OB use, on-site TV/film production and many community users) through to the medium term (2012-2018).²⁵ This is supported by ETSI (European Telecommunications Standards Institute), which concluded in technical report TR 102 546 that 'the combination of antenna size, equipment size and propagation characteristics mean that UHF spectrum is the only solution for practical PWMS (Personal Wireless Microphone System) applications in the vast majority of scenarios'.
- 6.5. A number of Independent Reports have demonstrated that supply of interleaved spectrum in the UK will not be sufficient to meet demand in the future and hence constrain entertainment production. There must be no legislative changes at an EU level that decrease the amount of UHF spectrum that is available for PMSE use and neither should any legislative changes force the PMSE sector to migrate from existing frequencies without full compensation being paid to equipment owners.
- 6.6. It has been suggested that new, 'spectrally efficient' digital equipment will solve the PMSE sector's problems in terms of spectrum scarcity by 'squeezing' more devices into the same bandwidth. With current technology, this is not the case.
- 6.7. Whilst it may be argued that digital systems are less susceptible to intermodulation distortion and hence can have multi-channel advantages, any improvements in spectral efficiency (if at all) are likely to come at the expense of audio quality and latency. This is confirmed by the CSMG Report²⁶.
- 6.8. It is BEIRG's firm position that no interleaved spectrum should be awarded for non-PMSE use unless it can be proven that there will be sufficient remaining to meet the PMSE sector's needs.

7. Cognitive devices

- 7.1. As to the Commission's desire for a common set of technical requirements within Europe for the use of cognitive devices, BEIRG notes that in the most current studies conducted in the USA by the FCC, cognitive devices have yet to prove that they can operate in a way that guarantees non-interference with licensed usage. We are opposed to them until such time as they are proven in field tests that replicate a variety of everyday situations to not pose a risk of interference to existing wireless PMSE equipment. However, BEIRG are firmly of the opinion that it will be impossible for manufacturers or users to ever provide an absolute guarantee that cognitive devices or other frequency agile systems will cause no interference to other spectrum users such as those in the PMSE sector.
- 7.2. The danger posed by frequency agile systems to the vitality of the PMSE sector cannot be underestimated. Without clear, interference free audio there will be widespread contraction in the size of the entertainment industry throughout Europe. When citizens of Europe attend music concerts, operas, plays, public readings etc they expect to enjoy the event and the quality of the performance is guaranteed in large part by interference free transmission. The Commission may want to consider what their own reactions may be to having a production of *The Rake's Progress* at La Monnaie interrupted at regular intervals by spectral interference caused by a frequency agile system or cognitive device.
- 7.3. In the UK, Ofcom have already made clear the technical barriers to adopting cognitive devices, in a consultation document on the 550-630 MHz and 790-854 MHz bands in August 2008 they noted in section 4.42 of the consultation document that "as yet, it is

²⁵ <http://www.ofcom.org.uk/radiocomms/ddr/documents/wirelessmics.pdf> page 73

²⁶ <http://www.ofcom.org.uk/radiocomms/ddr/documents/wirelessmics.pdf> page 40

unknown whether cognitive technologies would be able to detect and avoid other potential uses of the cleared spectrum. Moreover, as explained in the DDR Statement there may only be a small incremental benefit in allowing cognitive access to the cleared spectrum over and above our proposal to allow cognitive use of the interleaved spectrum. This leads us to believe that the associated costs and risks to licensees of the cleared spectrum might be too high given the size of the possible benefits. If, in the future, cognitive radio is developed that can be used in the cleared spectrum, these could be used by licensees.²⁷

- 7.4. BEIRG believes that it is essential for European regulators to undertake their own testing of cognitive equipment and take into account test results throughout the EU as well as the United States.²⁸ It is absolutely crucial that the testing process be rigorous and undertaken with a methodology agreed with incumbent licensees, which would be PMSE stakeholders in the case of the interleaved spectrum.
- 7.5. It is imperative that cognitive radio devices do not interfere with all incumbent users and licensees of interleaved spectrum. The PMSE sector must be fully and actively involved in the testing process, which should be conducted at a dignified pace. It is essential that PMSE sector representatives, as well as European regulators, are completely satisfied that cognitive devices will not interfere with their applications before any cognitive access to the interleaved is permitted.

8. Future development of wireless microphone applications and other secondary uses of UHF spectrum

- 8.1. As determined by our opposition to the development of Single Frequency Networks it follows that BEIRG disagree that there is a need for a migration path for secondary users of the UHF spectrum.
- 8.2. Faced with growing demand for their services, operators in the PMSE sector require, if anything, more not less spectrum. Removal of the interleaved spectrum which provides both flexibility and localised accommodation for excess demand would severely hamper the ability of the industry to perform and curtail the enjoyment of those social and cultural activities which the citizens of Europe benefit from. 'Future demand is a function of the number of organisations making use of PMSE, and the extent of their use of equipment. A study commissioned by Ofcom concerning the DDR from Sagentia (formerly known as Scientific Generics) estimated future demand for PMSE by considering both these factors. It forecast year-on-year increases of 30% in the demand for PMSE amongst community organisations, and 12% in demand from small-scale commercial organisations. The take-up of PMSE equipment for both uses was forecast to increase by 25% between 2006 and 2009, and 15% between 2010 and 2012.'²⁹
- 8.3. BEIRG would therefore welcome an EU level mandate to the CEPT that would examine the potential for harmonising spectrum within the UHF band for use by the PMSE sector. A mandate such as this would enable national regulators to lay out a path for possible migration to protected spectrum, guaranteed for PMSE use across the Union. This would also have the added benefit of enlarging the market for PMSE equipment which would lead to greater cross-border trade and reduced capital costs

²⁷ See <http://www.ofcom.org.uk/consult/condocs/clearedaward/condoc.pdf> Section 4.42

²⁸ The prototype cognitive radio devices being are currently being designed to detect U.S. 8VSB DTV signals, not the

OFDM-A type used in the UK and elsewhere in Europe. Also, these cognitive devices submitted to the FCC so far do

not even pretend to be able to detect wireless microphones let alone offer protection. This does not entail a genuine

cognitive radio function and therefore are only in effect manual scanners.

²⁹ Sagentia, Use of UHF Spectrum for Programme Making and Special Events in the UK, http://www.ofcom.org.uk/consult/condocs/ddr/reports/report_sagentia.pdf , pg. 15

which could spur on growth in the industry.

- 8.4. Harmonising a part of the UHF spectrum for primary use and the use of wireless microphone applications would also have the added benefit of allowing for faster, more effective innovation. If manufacturers know that the industry has access to spectrum designed for its purposes and guaranteed for a substantial period then this will enable them to justify the investment in new equipment designed to make more efficient use of spectrum. As a disparate and diverse industry that serves a number of different communities and customers we would encourage the Commission to take a lead on this issue so that PMSE industry participants might be able to enjoy the same benefits of the single market that currently only multi-billion euro companies like the MNOs are able to access.