



Digital Dividend Review: band manager award

British Entertainment Industry Radio Group (BEIRG)

Response to consultation on detailed award design

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Contents

1. Executive summary
2. Introduction
3. Interleaved spectrum availability for PMSE post-DSO
4. DTT protection options
5. Moving the PMSE sector to full market mechanisms for spectrum access by 2018
6. The Selection Criteria
 - 6.1. 'Commitment to' and 'understanding of' the PMSE sector
 - 6.2. Securing 'efficient' use of spectrum
 - 6.3. Operational ability
7. The band manager's obligations to PMSE
 - 7.1. 'Reasonable' PMSE demand
 - 7.2. FRND pricing
 - 7.3. Duration of PMSE protected access
8. Enshrining commitments as licence obligations
9. Notice period for revocation of the licence for spectrum currently used for PMSE
10. Technical licence conditions
11. Assessing applications
12. Spectrum that Ofcom do not propose to award
13. Temporary access to the cleared spectrum
14. Cognitive devices
15. MOD-managed bands
16. MPEG-4 and DVB-T226 technologies
17. Additional digital television platforms and potential interleaved spectrum

1. **Executive summary**

- 1.1. BEIRG welcomes Ofcom's recognition that intervention is required to save the Programme Making and Special Events (PMSE) sector from market failure and the consequent decision to award spectrum to a single band manager with PMSE obligations through a beauty contest rather than auction. We applaud Ofcom's recognition that an auction process is incompatible with the objectives of avoiding market failure and disruption to the PMSE community.
- 1.2. But despite Ofcom's decision, the current 'white space' maps show that spectrum availability for the PMSE sector will dramatically reduce following the spectrum auctions. The consequence will be that large scale live and recorded productions such as musicals and live music events will not be able to take place in many locations across the UK. This will result in the closure of many major venues and long term cultural and employment loss in the affected areas, and within the industry in general.
- 1.3. Now Ofcom has decided to intervene, they must ensure that the aim of intervention is fulfilled and sufficient spectrum is awarded to the band manager with PMSE obligations. They must also ensure that the band manager is aligned with the interests of the PMSE sector through the beauty contest. In addition, Ofcom must ensure that the PMSE sector is never priced out of the spectrum market, whether through excessive AIP charges or by losing out to alternative users of the band manager's spectrum with deeper pockets.
- 1.4. We have seen no evidence that 2018 is anything but an arbitrary end-date to end PMSE protection obligations. The fact that the band manager's PMSE protection obligations has an end date in absence of such evidence will delay market failure rather than avert it. Therefore, the band manager's obligations to PMSE must not cease unless and until it can be proved that the PMSE sector can compete in full market mechanisms.
- 1.5. It seems absurd to restrict the PMSE sector's security of access to spectrum on which it depends to one fifth as long as the security of access to spectrum on which it does not currently depend in terms of notice period for licence variation or revocation.
- 1.6. This consultation submission is written on the basis that channel 69 will be awarded to the band manager with PMSE obligations, but are aware that the situation with regard to channel 69 has changed since the consultation was published, including a potential increase in opportunity cost as associated with support for a pan-European band for mobile between 790 and 862 MHz. Ofcom have since initiated discussions with stakeholders about the possible migration of PMSE from channel 69.

2. **Introduction**

- 2.1. The £15 billion p.a. British Entertainment Industry relies on the use of short-range wireless technology such as radio microphones, in-ear monitor systems and talkback for the production and delivery of live and recorded content. This technology is crucial for the performing arts, broadcasting, news gathering, film and independent production, corporate events, concerts, night venues and sports events. Without wireless technology, the standard of content would suffer; in many cases, production would not be able to take place. The industry that uses these devices is referred to as the Programme Making and Special Events (PMSE) sector. This sector is responsible for the production of content that receives world-wide acclaim and continues to attract a global audience.
- 2.2. As in all radiocommunications, wireless devices used in the British Entertainment Industry transmit across certain frequencies, which are part of the electromagnetic spectrum. Therefore, users need to access interference-free spectrum in order to operate these technologies. The spectrum that the PMSE sector depends on for use of radio microphones and in-ear monitor systems lies between 470 and 862 MHz, which is called the 'UHF' band. The PMSE sector uses this spectrum, with the exception of 854-862MHz or 'channel 69', on a secondary user basis. The current primary use of the UHF band, other than channel 69, is for television broadcasting. Wireless microphones and in-ear monitors use the 'gaps' in between the television broadcast frequencies. These gaps are known as the 'interleaved spectrum' or 'white spaces'.
- 2.3. Large-scale live productions such as West-End musicals require at least 50 MHz¹ of interference-free spectrum to operate essential radio microphones and in-ear monitors. The available interleaved spectrum and channel 69 can currently accommodate these large-scale productions in the vast majority locations across the UK. If large-scale live and recorded productions are to be able to continue to take place across the UK, at least 50 MHz of interference-free spectrum is required for PMSE at every venue following the Digital Dividend.
- 2.4. Spectrum is a valuable and finite resource, for which there are many competing uses. The State has recognised this and Ofcom is now in the process of implementing the policy known as 'spectrum liberalisation', of which the 'Digital Dividend Review' is an important part. The UK is currently in the transition from 'analogue' to 'digital' television broadcasting, known as the 'digital switchover' (DSO). While digital and analogue television both broadcast in the UHF band, digital television is more efficient than its analogue counterpart. Therefore, less UHF spectrum will be required for television transmissions after digital switchover has taken place, thus leaving a considerable amount of spectrum unused for this purpose. This UHF spectrum that will be 'freed up' by the digital switchover is referred to as the 'digital dividend' and Ofcom currently plan to sell this to the highest bidder via an auction process. However, this 'digital dividend' spectrum is currently used for wireless microphones and in-ear monitors that are critical to the British Entertainment Industry. Far from being 'unused', the UHF band is essential for PMSE applications.
- 2.5. In the DDR consultation, Ofcom proposed to sell the spectrum to be cleared of analogue television and the 'white spaces' between digital television broadcasts to the highest bidder via an auction process. However, because the PMSE sector is a disparate and diverse community of content producers, manufacturers, rental organisations and freelance engineers, it lacks the coordination mechanism and financial resources necessary to rival powerful multinationals in a bidding process. If forced to compete in an auction to secure the spectrum on which it depends, the PMSE sector and a large part of the British Entertainment Industry would face market failure. Ofcom has now recognised this danger and has decided to award some interleaved spectrum and channel 69 to a band manager with obligations to meet 'reasonable' PMSE demand².

¹ Figures that we use are for UK productions. This does not represent the maximum amount of spectrum that will be required for large-scale events.

² With regard to channel 69, please see executive summary point 1.4

- 2.6. The PMSE sector welcomes Ofcom's decision to intervene and award some spectrum to a band manager. However, despite claims to the contrary, this spectrum will be insufficient according to current data.
- 2.7. The current 'white space maps' show that there will be insufficient spectrum availability post-DSO for musicals, live-music events and other large-scale productions including political and sports events to take place in many locations across the UK after the UHF spectrum currently used for PMSE is sold and new services deployed. This will result in the closure of many major venues such as theatres, concert halls and festivals that are dependent on these live productions, which in turn will result in long term cultural and employment loss in those regions, and within the industry in general. In addition, if the size of the touring theatre circuit were reduced by the closure of certain theatres resulting from lack of spectrum availability, the loss of major venues from a national tour would make many tours financially unviable to produce and, as a consequence, could cause the closure of more venues than just those directly affected.
- 2.8. Ofcom's current proposals, if implemented, will preclude large-scale productions from ever taking place in many locations across the UK, thus depriving the citizens and consumers in those areas the opportunity to experience these events. A geographic cultural divide will be created whereby certain major venues, including those in Edinburgh, Nottingham, Stoke, Woking, Bradford, Southend, Swansea and Guildford³ will not be able to host musicals and live music events whereas some others will be able to continue to do so.
- 2.9. If Ofcom release the spectrum freed up by the digital switchover for new uses as each region switches over to digital broadcasting, culminating in London in 2012 prior to the Olympics, there will be neither sufficient spectrum nor sufficient equipment availability for the Olympics to be broadcast according to current production standards. The London Organising Committee for the Olympic Games (LOCOG) agrees with our conclusion that all digital dividend spectrum should be reserved for PMSE use on a nationwide basis until after the Olympics in 2012⁴.
- 2.10. Prior to Ofcom's two recent consultations on the DDR, the PMSE sector was told by Ofcom officials that the 'white space' maps that show spectrum availability for PMSE post-DSO were pessimistic. However, Ofcom have now proposed to remove some interleaved spectrum and channel 38 from the package to be awarded to the band manager. As a consequence, even less spectrum will be available for PMSE after auctions have taken place and new services deployed. In Edinburgh, for example, under current plans less than 40%⁵ of the requisite spectrum for large-scale PMSE productions will be available post-DSO.
- 2.11. BEIRG has demonstrated that the spectrum availability problem for PMSE post-DSO is unlikely to be solved⁶ by (1) altering the protection options of the DTT multiplexes, (2) the arrival of new 'spectrally efficient' technologies, (3) using 'alternative' spectrum currently available for PMSE or (4) acquiring spectrum not to be included in the band manager award through the auction process. Therefore, Ofcom must award more spectrum to the band manager with PMSE obligations to ensure that there will be sufficient spectrum to cater for current and anticipated future levels of PMSE demand after the digital switchover has taken place.

³ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/beirg.pdf>

⁴ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/locog.pdf>

⁵ Section 1.3 <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/beirg.pdf>

⁶ At least into the medium term

3. **Interleaved spectrum availability for PMSE post-DSO**

- 3.1. Ofcom have stated that they are 'aware that professional users of wireless microphones are concerned about the amount of interleaved spectrum they will be able to access in certain locations after DSO'⁷ but do not address this issue in the band manager consultation document. Ofcom have also stated that they 'continue to work on the basis that there should be broadly sufficient capacity in the interleaved spectrum to be awarded to the band manager to allow existing PMSE use to be accommodated.'
- 3.2. We note Ofcom's cautious use of language with regard to their thoughts on interleaved spectrum availability for PMSE post-DSO. The phrase 'we continue to work on the basis that there should be broadly sufficient capacity' indicates that Ofcom are uncertain whether there will be sufficient spectrum for PMSE post-DSO and to what extent this will be the case across the UK. Indeed, Ofcom's caution is well founded. We have demonstrated in our two previous DDR consultation responses that, according to Ofcom's current white space maps, interleaved spectrum availability⁸ for the PMSE sector will dramatically reduce following the spectrum auctions. The consequence will be that large scale live and recorded productions such as musicals and live music events will not be able to take place in many locations across the UK. This will result in the closure of many major venues and long term cultural and employment and skills loss in the affected areas, and within the industry in general.
- 3.3. As we have demonstrated in our responses to the cleared and geographic interleaved award condocs, Ofcom's claim that there will be broadly sufficient capacity in the interleaved spectrum to allow 'existing' PMSE use to be accommodated post-DSO is based on a fundamental misunderstanding of how the PMSE sector functions and lack of information about PMSE spectrum demand.
- 3.4. When Ofcom say 'existing' PMSE use, what they mean is 'PMSE demand based on JFMG licensing data from 2005'. This data under-represents actual PMSE demand for the following reasons:
- 3.4.1. for any single channel 69 licence any number of systems may be used. For instance, a rental company could have any number of channel 69 units but would pay the same amount as an individual with a single unit;
- 3.4.2. productions such as musicals do not necessarily tour every year and are not staged at a particular venue every year. The licensing data from a single production year gives a woefully inadequate representation of past and future PMSE demand. For instance, the Haymarket Theatre in Leicester was closed for refurbishment in 2005;
- 3.4.3. recorded PMSE demand increased by 13% between April 2005 and March 2006 and 11% between April 2006 and March 2007 (according to JFMG licensing data⁹) and will continue to increase. Indeed, Ofcom themselves have stated that 'there is some evidence that PMSE demand for this spectrum will increase significantly';¹⁰
- 3.4.4. there is a high-proportion of unlicensed PMSE usage, which can be regarded as a consequence of the fact that Ofcom has undertaken neither invigilation nor enforcement of the licensing regime¹¹. Moreover, despite the industry having raised this concern, there is no evidence that Ofcom is going to do anything about this problem in future, which poses problems for any potential band manager. While the onus for purchasing a licence lies with the user, if there is no incentive to do so then

⁷ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> section 1.13

⁸ Including channel 69

⁹ <http://www.jfmg.co.uk/pages/news/archive.htm#summary>

¹⁰ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> section 5.47; see also www.ofcom.org.uk/consult/condocs/ddr/reports/quotient_associates.pdf and www.ofcom.org.uk/consult/condocs/ddr/reports/report_sagentia.pdf.

¹¹ As evidenced by the lack of a single prosecution of a PMSE user for operating without a licence

the proliferation of unlicensed use is unsurprising. In addition, there is little awareness in some parts the PMSE sector, especially among community users, that a licence is required to operate a wireless microphone, IEM or talkback system.

- 3.5. Large-scale live and recorded productions such as musicals and live music events require in excess of 50MHz of interference-free spectrum to be able to take place. Ofcom's current white space maps show that in Edinburgh, for example, there will only be 19.6MHz of UHF spectrum available, including channel 69, for PMSE post-DSO¹². This is less than 40% of the required spectrum for staging musicals and large-scale PMSE productions. The situation will be even worse in Woking where there will only be 13.8MHz of UHF spectrum available, including channel 69, for PMSE post-DSO, which is less than 30% of the required amount.
- 3.6. To illustrate one consequence of the reduction in spectrum availability, it is important to note that the country's largest touring theatres rely on musical productions for over 50% of their annual output. In the event that through the loss of spectrum it becomes impossible to stage these shows at certain theatres, the theatres would have to close¹³. In addition, if the size of the touring theatre circuit were reduced by the closure of certain theatres resulting from lack of spectrum availability, the loss of major venues from a national tour would make many tours financially unviable to produce and, as a consequence, could cause the closure of more venues than just those directly affected.
- 3.7. BEIRG's responses to the DDR cleared¹⁴ and DDR geographic interleaved¹⁵ award consultations provide a detailed explanation of the extent and impact of the reduction in spectrum availability for PMSE post-DSO. However, it is worth noting that musicals, live music events and other large scale productions will be impossible to stage at major venues in Edinburgh, Nottingham, Stoke, Woking, Bradford, Southend, Swansea, Dundee, Tunbridge Wells and Guildford post-DSO under current DDR plans. These examples only illustrate the wider problem of spectrum scarcity post-DSO.
- 3.8. As stated in the introduction, we have demonstrated¹⁶ that the spectrum availability problem for PMSE post-DSO is unlikely to be solved¹⁷ by (1) altering the protection options of the DTT multiplexes, (2) the arrival of new 'spectrally efficient' technologies, (3) using 'alternative' spectrum currently available for PMSE or (4) acquiring spectrum not to be included in the band manager award through the auction process. This conclusion is reinforced by the draft report prepared for Ofcom¹⁸ by consultants CSMG. Therefore, Ofcom must award more spectrum to the band manager with PMSE obligations to ensure that there will be sufficient spectrum to cater for current and anticipated levels of PMSE demand after the digital switchover has taken place.
- 3.9. Having said this, we recognise Ofcom's commitment to recast the white space maps based on median protection coverage options for DTT in overlap areas. We also appreciate that Ofcom have taken into account our concerns that the capacity of useable interleaved spectrum for PMSE cannot be increased unless the RF field strength from the 'non-preferred' DTT transmitters is below the level at which they interfere with PMSE applications. We look forward to the publication of the new white space maps and hope that they will show sufficient interleaved spectrum capacity for PMSE to continue at current and anticipated levels across the UK post-DSO. If they do not, however, Ofcom must award additional spectrum to the band manager with PMSE obligations.

¹² If Ofcom include interleaved channels 52 and 30 in the geographic interleaved awards as they have proposed

¹³ Many of these large theatres are unsuitable for the staging of Drama. Furthermore, the supply of Drama will not increase to fill the gap left by the absence of musicals.

¹⁴ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/beirg.pdf>

¹⁵ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/beirg.pdf>

¹⁶ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/beirg.pdf> sections 1.6 - 1.9

¹⁷ At least into the medium term

¹⁸ But not published by Ofcom

3.10. It is essential to prove in practice as well as theory that Ofcom's plan to implement the median protection coverage options for DTT in overlap areas will increase interleaved capacity for PMSE. In light of this, it is essential that we work with Ofcom to carry out practical testing of PMSE applications in the spectrum that interleaves between digital broadcasts to examine whether the white spaces maps are accurate, particularly in those locations where the adjustment of the DTT protection options may lead to an increase in interleaved capacity for PMSE.

4. **DTT protection options**

4.1. Ofcom have stated the following in the band manager condoc:

4.1.1. 'We have assessed the level of protection from new uses of that spectrum that should be given to existing DTT services. This is relevant to the band manager award as this level of protection will also dictate the amount of interleaved spectrum available for PMSE users¹⁹.'

4.1.2. 'We have proposed adopting the option that protects the following (with a higher variable increase in interference of more than 1 dB): the DPSA; the transmitter that offers the best analogue coverage; and the "correct" national/regional service, particularly in border areas²⁰.'

4.1.3. 'The impact of this proposal would be increased availability of interleaved spectrum for PMSE users than existing assumptions allow. This means, for example, that there would be more spectrum available for PMSE use than we indicated would be the case in our statement on access to interleaved spectrum for PMSE after DSO, published on 16 January 2008²¹.'

4.2. As stated above, we welcome Ofcom's attempt to increase the capacity of the interleaved spectrum available to PMSE post-DSO by altering the protection options to DTT multiplexes in locations where there are coverage overlaps. However, even if Ofcom protect only the coverage of the 'best' DTT transmission site (referred to as the Digital Preferred Service Area ('DPSA') in NGW's original study for 71 transmission sites), this would not necessarily increase the amount interleaved spectrum available for wireless microphones and IEMs post-DSO. While the 'non-preferred' DTT transmission sites are no longer protected in the DPSA protection option (in the overlap region), RF will still be present and, depending on the field strength of the signal, will potentially prevent low-power PMSE applications from being used. Furthermore, Ofcom state in point 5.35 of the geographic interleaved award consultation document²² that '*predictions cannot tell us how many of these households actually receive signals from overlap DTT multiplexes and hence could be affected, in practice, by new DTT transmissions after DSO.*' If Ofcom cannot be sure how many households actually receive signals from overlap DTT multiplexes then they cannot be sure to what extent they can 'enlarge' the white spaces available for PMSE applications by altering DTT protection options.

4.3. We note that Ofcom have considered various options for the protection of existing DTT multiplexes from new DTT services using geographic interleaved spectrum and came to the conclusion 'that the median option offers the best balance between maximising the economic value of the geographic interleaved spectrum and minimising the potential disruption to overlap coverage of the existing DTT services, and therefore propose this form the basis of the planning for new services.'²³

4.4. We are extremely concerned that Ofcom's cost-benefit analysis of the 'median' and 'DPSA'

¹⁹ <http://www.ofcom.org.uk/consult/condocs/bandmgr/section5.28>

²⁰ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> section 5.30

²¹ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> section 5.31

²² <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/interleaved.pdf>

²³ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/interleaved.pdf> section 5.54

protection options did not take into account the potential benefits to citizens and consumers of the UK by increasing the capacity of the interleaved spectrum for PMSE use. It may be the case that the median option offers an acceptable balance between protecting reception of DTT services and maximising new DTT services using geographic interleaved lots. However, the DPSA rather than the median option may offer a better balance between protecting the reception of DTT services and maximising PMSE and new DTT services using the interleaved spectrum.

It should also be noted that PMSE applications emit RF at much lower power than DTT transmissions. This power differential could be reflected in different interference protection obligations for PMSE and the new DTT services with regard to the existing DTT multiplexes. Therefore, we propose that the DPSA option should apply to PMSE applications whereas the median option could apply to new DTT services. Having said this, it is not clear whether and to what extent the DPSA option would create more interleaved capacity for PMSE than the median option. In addition, it is not clear whether and to what extent the median option would imply more interleaved capacity for PMSE than the 'all overlaps' option for the reasons outlined in point 4.2 (above).

- 4.5. Due to the potential benefits of the DPSA option to PMSE relative to the median option, Ofcom should produce separate white space maps for the DPSA and median options, make them available, and then compare the additional interleaved capacity for PMSE that each would create (if any). This comparison would lead to a better informed decision.
- 4.6. Please see points 3.7 and 3.8 above for our further views on Ofcom's proposed approach to protecting reception of DTT services.

5. **Moving the PMSE sector to full market mechanisms for spectrum access by 2018**

5.1. Ofcom have stated the following:

5.1.1. PMSE is an existing use of interleaved spectrum. It comprises a large and diverse community of businesses, community organisations and individuals. We think that PMSE users would find it difficult to coordinate a bid for access to spectrum, and we think there is a high risk of market failure as result²⁴.

5.2. Since Ofcom recognised that intervention was required to save the PMSE sector from market failure, they decided to award a package of interleaved spectrum to a band manager with PMSE obligations. This was a welcome decision.

5.3. Ofcom have, however, also stated the following:

5.3.1. Generally speaking, we consider that the market is best placed to secure the optimal use of spectrum. In the long term, we would also expect this to be true for PMSE spectrum access²⁵.

5.3.2. There are barriers to PMSE users engaging in a market at this time, and these barriers are sufficiently severe to suggest that a reasonable period of transition is required to overcome them²⁶.

5.4. While Ofcom have recognised that there would be a high risk of market failure if the PMSE sector was forced to access spectrum via market mechanisms (i.e. compete in auctions against more centrally organized bodies with deeper pockets) now, Ofcom believe that the PMSE sector will be able to do so by 2018, which is when, under current plans, the band manager's obligations to PMSE will cease.

²⁴ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/statement.pdf> section 1.41

²⁵ <http://www.ofcom.org.uk/consult/condocs/bandmng/condoc.pdf> A5.5

²⁶ <http://www.ofcom.org.uk/consult/condocs/bandmng/condoc.pdf> section 4.7

- 5.5. We have seen no evidence that 2018 is anything but an arbitrary end-date to end PMSE protection obligations. The fact that there is an end date to the band manager's PMSE protection obligations in absence of such evidence risks delaying market failure rather than averting it. Therefore, the band manager's obligations to PMSE must not cease unless and until it can be proved that the PMSE sector can compete in full market mechanisms.
- 5.6. We believe that Ofcom has not justified their claim that the PMSE sector will be able to compete for spectrum via full market mechanisms by 2018²⁷. Indeed, it is unclear whether the PMSE sector will ever be able to do so. Ofcom has recognised that the PMSE sector 'comprises a large and diverse community of businesses, community organisations and individuals'²⁸ that 'could not at present aggregate their demand to take part in a market-based approach to spectrum access.'²⁹ We believe that Ofcom should explain what they believe will change to allow the PMSE sector to overcome the 'risks of coordination failure'³⁰ by 2018 and be able to compete with those that want to use the same spectrum. At present 2018 seems like an arbitrary end-date.
- 5.7. In relation to the 2018 end-date for PMSE protected spectrum access, it is worth reiterating what was said in the PMSE Pro User Group's response to Ofcom's consultation on Programme Making and Special Events: Future Spectrum Access: 'whilst manufacturers have invested, and continue to invest, heavily in developing new technologies the earliest conceivable date to complete this transition would almost certainly adhere to the following timetable. It is the PMSE Pro User Group's considered opinion that there would be a further development lead in time for new equipment of at least 3 years from now, followed by a further 7 years for market penetration, and then in addition a further period for the equipment's life span. This would constitute a minimum period of 10 years for professional usage, and for all that total 20 year period (3+7+10 years), there would have to be the certainty of defined spectrum availability.'
- 5.8. Ofcom, on the other hand, believe that 'a protection period of 10 years, lasting until 2018' achieves the 'balance' of the 'lifecycle of equipment with the opportunity cost of precluding alternative uses of the spectrum'³¹. As per section 5.6 above, we strongly disagree with this assessment. In addition, the 2018 end-date would not entail a protection period of 10 years for which PMSE equipment has a guaranteed life-cycle. The change in pattern of interleaved spectrum availability as a result of the transition from analogue to digital terrestrial television broadcasting will mean that existing wireless microphones and IEMs that operate in the currently available interleaved spectrum will either be rendered redundant or require significant and expensive modification in order to operate in the spectrum that interleaves between the digital television broadcasts. Users of these PMSE applications will be forced to re-equip as DSO takes place in the regions in which they are based, a process which will culminate in London in 2012. Therefore, the protection period for which PMSE equipment has a guaranteed life-cycle will vary from location to location across the UK and will be defined, strictly speaking, as the time between DSO taking place in each region plus the transitional access for PMSE to the cleared spectrum (Ofcom's latest proposal being 12 months for channels 31-40 and 61-68 in regions where DSO first takes place) and 2018. This protection period will be shortest in London, and will only last for 5 ½ years, at which point users may be forced to re-equip again, at considerable expense.
- 5.9. According to Ofcom, the PMSE sector can be 'helped' in the transition to full market mechanisms by 2018 by phasing in AIP charges to the band manager to full opportunity cost over time and encourage PMSE to migrate from high to low or no-demand spectrum to be awarded to the band manager.

²⁷ At a recent stakeholder event Ofcom stated that they will provide data to justify this assertion.

²⁸ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/statement.pdf> section 1.41

²⁹ <http://www.ofcom.org.uk/consult/condocs/bandmng/condoc.pdf> section 4.5

³⁰ <http://www.ofcom.org.uk/consult/condocs/bandmng/condoc.pdf> section 4.5

³¹ <http://www.ofcom.org.uk/consult/condocs/bandmng/condoc.pdf> sections 9.28 and 9.29

- 5.10. While Ofcom are proposing to phase in AIP for each band to full opportunity cost, they have not indicated that they will undertake invigilation and enforcement of the licensing regime. This will make it more difficult for the band manager to recoup AIP charges. Ofcom are fully aware that unlicensed spectrum use by the PMSE sector is a major problem. Ofcom has undertaken neither invigilation nor enforcement of the licensing regime³², as evidenced by the lack of a single prosecution of a PMSE user for operating without a licence. Without such a punitive incentive, the proliferation of unlicensed use is unsurprising.
- 5.11. If Ofcom intend to help the PMSE sector move to market-based spectrum access and use spectrum more efficiently by phasing in AIP charges to full opportunity cost, there must be an incentive for PMSE users to licence. Otherwise, the band manager will not have a viable business model. Illegal PMSE use of spectrum will remain high and AIP charges will increase. This will force the band manager to increase licence fees for the small minority of PMSE users who do pay for a licence, which will in turn force those same PMSE users to either operate illegally or reduce their spectrum use, the latter of which will have the consequence of either reducing production standards dramatically or prevent production from happening at all. In turn, these actions from the PMSE users forced to pay higher prices will reduce the band manager's revenue base to the extent that it may have to return the spectrum to Ofcom (since it could not afford to pay the AIP charges), the result of which will be a reduction in spectrum available to the PMSE industry, whether licensed or unlicensed. If this process continues (as it would in absence of an enforcement mechanism), the PMSE sector would have access to no spectrum, which would lead to market failure. If Ofcom wishes to prevent market failure for the PMSE sector and believes that the PMSE sector must be able to access useable spectrum, then it must ensure that the band manager will be in a position to recoup AIP charges through licensing. This can be achieved by (1) defining specific criteria that the band manager must reach to encourage and promote compliance and (2) undertake invigilation and enforcement of the licensing regime.
- 5.12. In relation to the 'benefits' of AIP, Ofcom have stated the following:
- 'Paying an AIP-based fee for spectrum incentivises users to use it more efficiently. This is, in part, because it will motivate users to assess how much value their existing spectrum access generates for them and whether they could reduce their costs by using spectrum more efficiently. If the value of the spectrum to a user is less than the fee to be paid, that user will be keen to reduce its spectrum use. This spectrum, in turn, may become available to other users. We envisage that spectrum pricing on this basis will help to ensure that those users that value spectrum most gain access to the resource³³'.
- 5.13. Whilst this statement reinforces what we have said above about the band manager having to return spectrum to Ofcom because it cannot recoup AIP through PMSE licensing because of the lack of an active enforcement mechanism, it also illustrates that Ofcom intends for the band manager to be able to make the spectrum it licences available to users other than PMSE. Indeed, Ofcom base their opportunity cost estimates on what these 'alternative users' would be prepared to pay for it. When assessing opportunity costs, Ofcom must be certain that these alternative users do exist and must also be certain about what they would be prepared to pay. Inaccurate opportunity costs, which would be reflected in AIP under current proposals, could artificially price the PMSE sector out of spectrum for which there would be no other users prepared to pay the same price for the spectrum. If Ofcom insist on imposing prices to the PMSE sector that will reach full opportunity cost over time, the mechanism for assessing opportunity cost must be transparent. In addition, there must be a grace period during which it cannot be imposed.
- 5.14. Ofcom must understand that the PMSE sector uses spectrum in a unique way (as explained in section 7 below); it does not deploy networks that are constantly transmitting. Rather,

³² Though it is Ofcom's responsibility to do so

³³ <http://www.ofcom.org.uk/consult/condocs/bandmngn/condoc.pdf> section 8.25

PMSE users, which are a diverse and disparate community, need to access spectrum intermittently, but intensively when they do so. Therefore, to expect individual PMSE users to be able to compete in a full market mechanism by 2018 to access spectrum which they require on a transient basis with other users who require constant spectrum access and are more centrally organised is unrealistic and could result in market failure at this point. Indeed, we question the PMSE sector's ability to pay full opportunity cost for spectrum access to the UHF bands on which we, Ofcom and CSMG agree that it depends.

- 5.15. Phasing in AIP to full opportunity cost over time is an artificial and imprecise method of ensuring that prices for spectrum access increase toward market rates gradually, which could result in a cliff edge for the PMSE when protected access is removed. Opportunity cost estimates are often inaccurate and change over time. One risk is that PMSE users will unexpectedly be priced out of the market in 2018 if the AIP for PMSE spectrum does not represent what competing users would be prepared to pay for it. In addition, the potential for large companies with deep pockets to buy spectrum currently used for PMSE as a reserve for deployment of as yet undeveloped technologies cannot be factored into opportunity costs, which only take into account existing viable technologies.
- 5.16. Ofcom's suggestion that the PMSE sector can be 'helped' in the transition to full market mechanisms by encouraging PMSE users to migrate from high to low and no-demand spectrum is unrealistic, at least into the medium term. Ofcom recently commissioned CSMG, a telecoms and media consultancy, to analyse how wireless microphones, in-ear monitors (IEM) and talkback systems might make more efficient use of spectrum and potentially operate in alternative spectrum to the UHF band, in the future. BEIRG is disappointed and surprised that Ofcom has not published the results of CSMG's analysis. We understand that the following conclusion appears in the draft report; that wireless microphone technology is unlikely to be able to operate in alternative spectrum to the UHF band, at least into the medium term. There are very few viable frequencies available for wireless microphones, IEM and talkback use. Wireless microphones and IEM use 470 – 862 MHz almost exclusively due to historical security of tenure, quality and quantity of spectrum. Talkback uses 425.3125-469.8750 MHz almost exclusively for the same reasons. Spectrum below 470 MHz has very limited capacity for wireless microphones and IEMs. Of those bands that are currently available for PMSE above 862 MHz, those above 1800 MHz are not desirable for use of wireless microphone and IEM systems and Ofcom has already started the auction processes for the 1517 MHz – 1525 MHz and 1785 MHz – 1800 MHz bands respectively³⁴.
- 5.17. While we recognise the principle behind Ofcom's proposals to award low and no-demand bands currently reserved for PMSE to the band manager with PMSE obligations, we believe that the aim to migrate users of wireless microphones and IEMs into these bands is unrealistic, at least into the medium term. Users of wireless microphones and IEMs depend almost exclusively on the UHF spectrum and will continue to do so. In general, the bands of low or no PMSE demand to be awarded to the band manager will either be too high or the bandwidth too narrow to be viable for wireless microphone or IEM use.
- 5.18. It is extremely puzzling that Ofcom are advocating the migration of PMSE users from high to low or no-demand spectrum when they have also acknowledged that 'these (high-demand) bands are often critical to PMSE users, not least as there are no identifiable alternatives to many of these bands in the short term to medium term'³⁵. Ofcom seem to agree with both BEIRG and CSMG that there are no viable alternatives to high-demand PMSE bands, presumably in reference to the UHF spectrum for wireless microphones and IEMs, in the short to medium term yet advocate moving from them to alternative bands nonetheless, which is absurd. This is another reason why we question Ofcom's proposal to impose prices based on full opportunity cost to the PMSE sector for access to these bands. If PMSE users of these applications are priced out of this spectrum before alternative spectrum is identified

³⁴ As far as BEIRG is aware, no wireless microphones or IEMs are currently manufactured to operate in either the 1517-1525 or 1785-1800 MHz bands

³⁵ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> A5.20

and equipment that operates in alternative spectrum has been developed and penetrated the market-place, then productions that are dependent on these applications will not be able to take place, this resulting in the adverse cultural and economic consequences that we have explained in previous submissions.

- 5.19. In addition to the real threat of the PMSE sector being priced out of the market entirely in 2018 when the band manager's obligations to PMSE will cease, the 2018 date will cause major problems to the sector in terms of equipment production. If the band manager's obligations to the PMSE cease in 2018, then the sector will have no security of access to the spectrum in which it previously operated. Without this certainty of access, manufacturers will not be able to produce equipment. In addition, rental companies and users of PMSE equipment will resist investments in equipment as it will not be 'future-proofed'. This would starve an industry of essential equipment and, in turn, stifle the staging PMSE productions earlier than the 2018 end-date.
- 5.20. The currently-proposed 2018 end-point of PMSE protected access to the interleaved spectrum could also result in users having to re-equip twice in five years (the first time being the change in pattern of interleaved spectrum availability following DSO in each region culminating in London in 2012), which would involve considerable expense.
- 5.21. The risks of the PMSE sector being priced out of the market and equipment availability issues could only be averted if no alternative users with deeper pockets wanted to access the same spectrum in 2018. Ofcom cannot guarantee this. As a consequence, there is no certainty that the PMSE sector will not face market failure when the band manager's obligations to PMSE cease in 2018.
- 5.22. We have seen no evidence that 2018 is anything but an arbitrary end-date to end PMSE protection obligations. The fact that there is an end date to the band manager's PMSE protection obligations in absence of such evidence risks delaying market failure rather than averting it. Therefore, the band manager's obligations to PMSE must not cease unless and until it can be proved that the PMSE sector can compete in full market mechanisms.
- 5.23. The fundamental point which is addressed by all the arguments above is that the PMSE sector requires access to sufficient quality and sufficient quantity of spectrum in perpetuity³⁶; in the interests of the PMSE sector and the citizens and consumers of the UK, Ofcom must guarantee this.

6. **The Selection Criteria**

6.1. 'Commitment to' and 'understanding of' the PMSE sector

- 6.1.1. We are concerned that Ofcom's alteration of their phraseology in relation to this selection criterion will potentially alter the institutional arrangements of the successful applicant to the beauty contest to the detriment of the PMSE sector. Therefore, Ofcom must revert to their original wording and possibly make this criterion more prescriptive.
- 6.1.2. In the annexes to the December DDR regulatory statement, Ofcom stated that they had decided to seek 'alignment between the interests of the band manager and PMSE users'³⁷ through the beauty contest. They also stated that 'the band manager best placed to stimulate trust among PMSE users is one whose interest is aligned with those of the PMSE users. This would ideally be reflected in its institutional structure as well as in its technical, financial and managerial capabilities to manage

³⁶ Wireless microphones and in-ear monitor systems are here to stay as they are essential production tools used worldwide to produce content, as such, it is difficult to envisage a situation in which these devices will no longer need to be used.

³⁷ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/ddrannex.pdf> A3.95

the spectrum efficiently on a day-to-day basis for PMSE and other uses.³⁸

- 6.1.3. Ofcom has since altered the phrasing of this criterion from ‘alignment of interests’ to ‘understanding’ of the PMSE sector. Ofcom dismissed the significance of this at the recent stakeholder event; they are wrong to do so. The altering of the phraseology materially alters the criterion and how that criterion can be met. This will result in candidates meeting the criterion without real alignment with PMSE interests, which could jeopardise the future of the PMSE industry.
- 6.1.4. We believe that, in the interests of the PMSE sector, Ofcom must revert to the original wording of this criterion. Selection criterion (1) should be that ‘each applicant must demonstrate that it is aligned with the interests of the PMSE sector’. In addition, Ofcom should reaffirm that this alignment should be ‘reflected in its institutional structure as well as in its technical, financial and managerial capabilities’. In order to guarantee that the band manager is aligned with PMSE interests, the PMSE sector should be directly represented in the institutional structure of the band manager. This is necessary for the following reasons:
- 6.1.4.1. to stimulate trust among PMSE users and encourage them to cooperate with the band manager;
 - 6.1.4.2. to help avoid the range of scenarios which could be damaging to the PMSE industry such as predatory pricing that can be excused on the basis of ‘promoting efficiency’;
 - 6.1.4.3. to actively encourage the PMSE industry, for example through policy or similar initiatives, to purchase licenses for spectrum usage and take more responsibility for enforcement. BEIRG is keen to ensure that revenue is raised through PMSE spectrum licensing and that an efficient collection system is established;
 - 6.1.4.4. to allow the PMSE industry to work in close conjunction with the band manager organisation to assist in any testing that might be necessary to ensure that any ‘cognitive’ or other wireless devices that might possibly share spectrum with PMSE cannot interfere with PMSE appliances. PMSE industry representatives as well as Ofcom must be satisfied that cognitive or other wireless devices will not interfere with their applications before cognitive access to the PMSE reservation is considered.
- 6.1.5. In relation to the specific commitments to PMSE users that Ofcom have proposed should be incorporated into the licence awarded, we agree with Ofcom that applicants must demonstrate:
- 6.1.5.1. knowledge of the PMSE sector (both professional and community users), the equipment it uses, its operational characteristics and the major issues that affect it now and are likely to affect it in the future;
 - 6.1.5.2. a realistic and informed approach to spectrum access for PMSE at major events, including advance communication with us where problems are foreseen;
 - 6.1.5.3. appreciation of the issue of unauthorised spectrum access by PMSE users and plans for helping to address this; and
 - 6.1.5.4. plans for communicating specifically with PMSE users.

³⁸ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/ddrannex.pdf> A3.97

6.2. Securing 'efficient' use of spectrum

- 6.2.1. As explained above, it is intended that the band manager will help PMSE users to move to a 'market-based' approach to spectrum licensing. More accurately, this means that the band manager will be expected to incrementally increase licence fees to levels at which PMSE users will be able to compete with other potential spectrum users on a level-playing field by the time PMSE protection ceases in 2018. The band manager will be forced to increase prices year-on-year as Ofcom charges the band manager AIP.
- 6.2.2. More specifically, Ofcom have proposed that the applicants to become the band manager must demonstrate the following:
- 6.2.2.1. technical knowledge of the characteristics of the spectrum to be awarded;
 - 6.2.2.2. plans for making more efficient use of the spectrum, with specific reference to a variety of services and technologies;
 - 6.2.2.3. plans for making use of other spectrum and how this will lead to more efficient use of spectrum in general;
 - 6.2.2.4. plans for moving PMSE users to a market-based approach to spectrum access; and plans for communicating with key stakeholders (in particular us and specific users and their representatives).
- 6.2.3. In relation to the way in which the band manager may be obligated to 'make more efficient use of spectrum', particularly licensing PMSE spectrum to alternative users and move 'PMSE users to a market-based approach to spectrum access' by 2018, please see our concerns explained in section 5 above.
- 6.2.4. We believe that Ofcom's proposals for this criterion will impose unreasonable demands on the band manager. In addition, the obligations that Ofcom has proposed, along with AIP charges to full opportunity cost, are likely to result in the PMSE sector being priced out of the spectrum on which it depends. This is the case for the following reasons:
- 6.2.4.1. wireless microphone technology is unlikely to be able to operate in alternative spectrum to the UHF band, at least into the medium term. Therefore, the idea that the band manager should encourage PMSE migration from high to low or no-demand frequencies is unrealistic;
 - 6.2.4.2. we question the PMSE sector's ability to pay full opportunity-cost for spectrum access. There are many factors why this is the case, including (1) the fact that the band manager will have no powers of enforcement, thus limiting its ability to generate revenue from licensing to PMSE users, much of which is currently unlicensed, (3) the disparate and diverse nature of the PMSE sector³⁹ and (4) the way in which the PMSE sector requires spectrum access;
 - 6.2.4.3. 2018 is an arbitrary end-date for ceasing PMSE protected access. Ofcom have produced no evidence to show that the PMSE sector will be able to compete for spectrum access via full market mechanisms;
 - 6.2.4.4. the way in which the PMSE sector requires spectrum access is incompatible with the way in which the vast majority of alternative users, such as broadcasters and telecommunications companies, require spectrum

³⁹ Which Ofcom have recognised

access;

6.2.4.5. It is unclear what Ofcom precisely means by making more 'efficient' use of spectrum. Throughout the consultation process Ofcom has justified its actions on the basis that it is mandated to secure 'efficient' use of spectrum as mandated by the Communications Act 2003, yet has never explained what this precisely means. There are many interpretations of 'efficient' that are incompatible. For example, we refer Ofcom to Vodafone's response to the DDR cleared award condoc in which it explains the difficulties in reconciling allowing licence-exempt use of the interleaved spectrum by cognitive devices with the spectrum liberalisation policy.

6.2.5. We believe that Ofcom's proposals for this criterion will impose unreasonable demands on the band manager. In addition, the obligations that Ofcom has proposed, along with AIP charges to full opportunity cost, is likely to result in the PMSE sector being priced out of the spectrum on which it depends.

6.2.6. In view of these problems, we believe that until Ofcom can demonstrate that the PMSE sector's 'coordination' problem with regard to amalgamating spectrum demand has been resolved, then the band manager's obligations to PMSE should remain in place. If the deployment of technologies other than PMSE precludes future use of frequencies for PMSE other than they should not be permitted to do so. In addition, AIP charges imposed on the band manager should reflect the PMSE sector's ability to pay, rather than the PMSE sector being forced to pay whatever Ofcom believe is appropriate in accordance with the aim to increase AIP charges to full opportunity cost.

6.2.7. Ofcom should also clarify what they mean by 'plans for making more efficient use of spectrum' and take into account the fact that different users need to access spectrum in different ways in terms of location and time.

6.3. Operational ability

6.3.1. We agree that each applicant will need to demonstrate that it operates or will be able to operate in the future on a sound financial basis, with appropriate managerial and technical expertise. In this regard, we believe that Ofcom's proposals in point 7.11 of the consultation document seem reasonable.

7. The band manager's obligations to PMSE

Ofcom have proposed that the band manager will be obliged to meet reasonable PMSE demand on FRND (fair, reasonable and non-discriminatory) terms. Ofcom propose that FRND terms would last until 2018, at which point all obligations to PMSE cease. Ofcom expect at this point that PMSE users would be able to pay for spectrum use at full market rates.

7.1. 'Reasonable' PMSE demand

7.1.1. We believe that 'reasonable' in the context of the band manager's obligations to PMSE should be more precisely defined and better take into account the nature of PMSE spectrum usage and PMSE spectrum demand than 'actual demand from PMSE users at FRND prices'. Our views on this proposed obligation must be read in conjunction with sections 5 and 6.2 of this consultation response.

7.1.2. Whilst the following is not an exhaustive list, we believe that, to meet 'reasonable' PMSE demand, the band manager needs to do the following:

7.1.2.1. provide sufficient quality, quantity, location and duration of PMSE spectrum

access for use of existing equipment, the value of which has yet to be amortised. Additionally, it would not be reasonable for the band manager to expect PMSE licensees to invest in and deploy new equipment in place of existing equipment for which the value has not been amortised. However, the band manager has no responsibility for PMSE equipment that operates in the spectrum that will not be available for PMSE post-DSO;

- 7.1.2.2. provide sufficient quality, quantity, location and duration of PMSE spectrum access for use of equipment that is available in sufficient quantities. Nor would it be reasonable for the band manager to expect PMSE licensees to use equipment that has not had sufficient time to penetrate the market or of which there are insufficient quantities available;
- 7.1.2.3. provide sufficient quality, quantity, location and duration of PMSE spectrum access for use of the quality of equipment that facilitates high production standards (e.g. a certain level of bandwidth to ensure high audio-standards). It would not be reasonable for the band manager to expect PMSE users to use equipment that sacrifices audio or other production standards for reasons of 'spectral efficiency' or other;
- 7.1.2.4. provide sufficient quality, quantity, location and duration of PMSE spectrum access for use of the quantity of equipment that facilitates high production standards. Nor would it be reasonable for the band manager to expect PMSE users to reduce the amount of equipment used to the extent that production standards would be sacrificed. For example, it would be unreasonable to demand that a musical production uses only 20 wireless microphone channels when 50 channels are required⁴⁰;
- 7.1.2.5. cater for the inconsistent nature of PMSE spectrum use in terms of location, date and duration of access. It is reasonable for the band manager to do so because it is a reflection of the nature of PMSE spectrum use, which is well-established, understood and will remain the case going forward. The PMSE sector needs to be able to access spectrum for use of short-range devices as and when it needs it, which is difficult to predict and, to a large extent, outside the direct control of the content producer/user⁴¹. In light of this, it would be unreasonable for the band manager to licence spectrum currently used for PMSE to alternative users that require a duration of spectrum access that will preclude the PMSE sector from using the same spectrum in the way to which it is accustomed. This reflects what we have said in section 5 of this document about the incompatibility of the way in which the majority of alternative users require spectrum access as compared with PMSE. Generally speaking, the PMSE sector needs to use spectrum for a relatively short duration in a small geographic location. Alternative users such as broadcasters and telecommunications companies need to use spectrum over a long period of time and, generally speaking, on a nationwide basis. It would therefore be unreasonable for the band manager to licence PMSE spectrum for incompatible alternative uses since this would preclude the PMSE sector from accessing the spectrum in the way it needs to;
- 7.1.2.6. provide sufficient quality, quantity and duration of PMSE spectrum access to cater for peak PMSE spectrum demand such as for special events;
- 7.1.2.7. provide sufficient quality, quantity and duration of PMSE spectrum access for use of equipment that needs to be deployed in the UK by PMSE users that are not based in the UK. For example it is reasonable for the band

⁴⁰ Mary Poppins is a current example

⁴¹ Short-term peak PMSE use of spectrum often cannot be anticipated well in advance of the event – for example Live 8

manager to expect that outside broadcasters will need to access spectrum for the coverage of special events;

- 7.1.2.8. recognise that professional productions using PMSE equipment such as wireless microphones require a certain amount of additional spectrum and equipment availability to facilitate ad hoc migration to redundant yet available spectrum if interference problems occur during the production. It would therefore be reasonable for the band manager to be obligated to supply sufficient spectrum that accommodates the requisite redundancy if the demand exists from PMSE users;
- 7.1.2.9. recognise that it would be inequitable to penalise the licensed user in terms of either pricing structures or provision of sufficient quality, quantity and duration of spectrum access unless and until an adequate system for policing and prosecuting unlicensed and interfering users is implemented;
- 7.1.2.10. provide interference-free quality of spectrum to the licensed user in accordance with the recognition that is reasonable for the licensed user to expect that the band manager should guarantee high quality of spectrum access for which it has paid;
- 7.1.2.11. expect that manufacturers of PMSE equipment will design, develop, test and market spectrally efficient equipment where there is a commercial opportunity to do so;
- 7.1.2.12. expect that the equipment used by the PMSE sector is of high quality in accordance with the recognition that the licensed user should only operate in the spectrum for which it has paid access charges;
- 7.1.2.13. allow for growth in spectrum demand from the PMSE sector and provide increased spectrum access in accordance with this increase in demand. As stated above, recorded PMSE demand increased by 13% between April 2005 and March 2006 and 11% between April 2006 and March 2007 (according to JFMG licensing data⁴²) and will continue to increase.

7.2. FRND pricing

- 7.2.1. FRND pricing terms only do not take sufficient account of the nature of the PMSE sector and how PMSE users need to be able to access spectrum in terms of quality, quantity, location and duration of access as explained above.

7.3. Duration of PMSE protected access

- 7.3.1. For the reasons explained in section 5, we believe that in order for Ofcom to avert market failure for the PMSE industry, the band manager's obligations to PMSE must remain until and unless it can be proven that the PMSE sector can access essential spectrum via market-based mechanisms. This may be achieved via an ongoing review process. Any decisions further to such a review should be subject to full public consultation and any decisions, if implemented, to involve a substantial and workable grace period. As it stands, Ofcom has not adequately justified their claim that the PMSE sector will be able to compete for spectrum via full market mechanisms.

8. Enshrining commitments as licence obligations

- 8.1. We believe that, while the commitments made by the applicant should be enshrined in the

⁴² <http://www.jfmg.co.uk/pages/news/archive.htm#summary>

licence conditions, Ofcom's current proposals for award criteria and licence obligations would be detrimental to the PMSE industry, particularly in relation to moving the PMSE sector to market-based mechanisms by 2018 and Ofcom's inadequate definition of 'reasonable' in relation to meeting PMSE demand.

9. **Notice period for revocation of the licence for spectrum currently used for PMSE**

9.1. We have the following concerns about Ofcom's proposal that the licence to be awarded in respect of bands currently used for PMSE should be subject to a notice period for variation or revocation on spectrum-management grounds of one year:

9.1.1. It is absurd to restrict the PMSE sector's security of access to spectrum on which it depends to one fifth as long as the security of access to spectrum on which it does not currently depend.

9.1.2. While Ofcom are using the concern that the band manager may renege on its licence obligations to PMSE as a justification for varying or revoking the licence to be awarded in respect of bands currently used for PMSE⁴³, we note that these powers will also allow Ofcom to revoke the licences for PMSE bands, even if the band manager is fulfilling its obligations to PMSE. For example, we are aware that channel 69, for example, has a high opportunity cost, which is likely to increase following the DDR cleared auctions. Ofcom may deem it to be in accordance with their statutory obligations to revoke the channel 69 licence (or licence of any other band currently used for PMSE) and sell it instead, with only one year's notice to PMSE users that depend on it. This provides the band manager with little certainty and the PMSE sector with little security of access, thus inhibiting the development and take-up of equipment to operate in these bands. Ofcom may argue that the PMSE sector should migrate to areas of spectrum to be awarded to the band manager that are not currently used for PMSE. In response to this possible counter-argument, we would point out the view shared by CSMG and ourselves that wireless microphone technology is unlikely to be able to operate in alternative spectrum to the UHF band, at least into the medium term. This view is echoed by Ofcom who have stated that 'there are no identifiable alternatives to many of these bands in the short term to medium term'⁴⁴.

9.1.3. Once any spectrum is awarded to the band manager with PMSE obligations, Ofcom should not revoke this licence unless the band manager is failing to fulfil its obligations to PMSE. Ofcom should not revoke the licence to channel 69 or any other channels used for PMSE for the sole reason of selling it.

9.1.4. In addition, it is worth questioning why a notice period of one year for revoking spectrum currently allocated to PMSE for reasons of protecting PMSE is required if there is an appropriate arbitration mechanism in place.

10. **Technical licence conditions**

10.1. In light of the advantages outlined in section 8 of the consultation document, generally speaking we support Ofcom's decision to use the block-edge mask approach for protecting PMSE users from interference.

⁴³ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> 6.7 Overall, we consider that a shorter notice period to enable us to intervene more quickly is more appropriate where there is a greater risk of significant disruption to PMSE users.

<http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> 6.21 We therefore consider that, for bands that are currently used for PMSE, we should set a notice period that is relatively short to give users confidence that we will be able to intervene if the band manager fails to meet its obligations. With this in mind, we propose that the notice period should be set at one year.

⁴⁴ <http://www.ofcom.org.uk/consult/condocs/bandmgr/condoc.pdf> A5.20

- 10.2. If the band manager requests to vary its licence in favour of SUR-based technical licence conditions then Ofcom's decision further to such a request should be subject to an impact assessment on the PMSE industry. Indeed, it may be the case that an application for SUR technical licence conditions might originate from the PMSE industry.

11. **Assessing applications**

- 11.1. We believe that the selection criteria should be altered in light of what we have said above in sections 5, 6 and 7 and applicants be scored against these amended selection criteria rather than those that Ofcom have currently proposed.
- 11.2. We welcome Ofcom's proposal to publish non-confidential sections of applications on their website and invite representations from interested third parties, representations which we plan to undertake.

12. **Spectrum that Ofcom do not propose to award**

- 12.1. In relation to channel 38, Ofcom have stated the following:

12.1.1. 'At present, PMSE users access channel 38 with geographic restrictions to avoid harmful interference to radioastronomy. We propose to award these access rights to the band manager, but they will last only as long as we sustain the protection of radioastronomy in channel 38 in the UK (i.e. until 2012). Thereafter, access will (be) a matter for agreement with the new licensee for channel 38.'⁴⁵

12.1.2. *Question 2. Do you agree with our proposal to award access rights to channel 38 that will last as long as we sustain the protection of radioastronomy in the UK?*

- 12.2. For reasons that we have explained in our response to the DDR cleared award consultation⁴⁶, we believe that if channels 31-40 and 61-68 are cleared and included in the DDR award, the PMSE sector should retain UK-wide access rights to all of the cleared spectrum in which it currently operates until after the Olympics in 2012. If channel 38 is to be cleared of radioastronomy and included in the DDR auctions then access rights to channel 38 must be retained for PMSE access until after the Olympics in 2012 along with the rest of the cleared spectrum. The spectrum in channel 38 that interleaves between radioastronomy services is currently used for wireless microphones and IEMs in many locations across the UK. If channel 38 is included in the cleared DDR award then this will further reduce spectrum availability for PMSE post-DSO, thus increasing the likelihood that there will be insufficient spectrum availability to cater for current and anticipated PMSE demand post-DSO. The same can be said if the interleaved spectrum in channels 61 and 62 is included in the cleared award.

13. **Temporary access to the cleared spectrum**

- 13.1. In relation to temporary access to the cleared spectrum, Ofcom have stated the following:

13.1.1. We believe that it may now be possible for us to increase the notice period by another six months, giving PMSE users a 12-month notice period in total. We may also be able to extend temporary access for PMSE to channels 31-40, with a similar notice period.

13.1.2. There is a potential benefit to PMSE users from having greater notice of the need to quit channels 63-68 in particular. This is because it could help them to phase the process of migrating to new frequencies and any equipment purchase beyond just like-for-like replacements.

⁴⁵ <http://www.ofcom.org.uk/consult/condocs/bandmngnr/condoc.pdf> section 5.21

⁴⁶ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/beirg.pdf> pages 23-28

- 13.1.3. The cost to potential providers of new services in the cleared spectrum may be very low or negligible as it may be unlikely that they will offer commercial services in the first 12 months after the award. This period may instead be used for further developing business plans and/or building physical infrastructure.
- 13.2. We welcome the fact that Ofcom have taken our concerns about transitional access to the cleared spectrum into account, as demonstrated by their proposal to increase the notice period of temporary PMSE access to the cleared spectrum to 12 months and extend it to apply to cleared channels 31-40 as well as 63-68.
- 13.3. However, for the reasons explained in our response to the DDR cleared award condoc⁴⁷, we strongly believe that Ofcom should not proceed with the current timetable of spectrum release. No cleared spectrum should be released until Ofcom proves that there will be sufficient quality and quantity of spectrum available for the PMSE sector post-DSO to meet current and anticipated requirements for use of wireless microphones, IEMs and talkback.
- 13.4. If Ofcom proceeds with release of the cleared spectrum because it has either (a) proved that there will be sufficient spectrum availability for the PMSE sector post-DSO or (b) disregarded BEIRG's concerns, we believe that temporary PMSE access to the cleared spectrum must be extended until after the Olympics in 2012, be UK-wide and apply to channels 31-40 as well as 63-68.
- 13.5. While the reasons for extending PMSE access to the cleared spectrum until after the Olympics in 2012 UK-wide are fully explained in our response to the DDR cleared condoc⁴⁸, to which we refer Ofcom here, some new information has come to light since our response was submitted which supports our arguments.
- 13.6. In our response to the DDR cleared award condoc we stated the following:
- 13.6.1. It is also doubtful that phased termination of PMSE access and phased availability of the cleared spectrum will be appropriate for the new operators of these bands. The new licensees will, in all probability, be intending to run their new services nationwide (telecommunications companies for example). As nationwide use of these bands will not be possible until London has switched over to digital broadcasting in 2012, it would have no value to evict PMSE users from the cleared spectrum until this date. Indeed, Ofcom recognise that 'it may be unlikely that they (potential providers of new services) will offer commercial services in the first 12 months after award' since 'this period may instead be used for further developing business plans and/or building infrastructure.'
- 13.7. Our argument that the phased availability of the cleared spectrum will not be appropriate for new operators of these bands is supported by the following statements from mobile telecommunications companies:
- 13.7.1. T-Mobile have 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.'⁴⁹
- 13.7.2. Vodafone have 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

⁴⁷ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/beirg.pdf> pages 23-28

⁴⁸ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/beirg.pdf> pages 23-28

⁴⁹ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/tmobile.pdf> page 10

spectrum will not be available for launch of mobile services until towards the end of 2012.⁵⁰

13.7.3. Orange have 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.'⁵¹

13.7.4. O2 have stated that 'National access to spectrum would be needed by mobile network operators to deploy mobile broadband services'⁵².

13.8. Our argument that the PMSE sector must retain access to all the cleared spectrum on a nationwide basis until after the London Olympics in 2012 has been supported by the London Organising Committee for the Olympic Games:

13.8.1. 'LOCOG believes that the entirety of the cleared spectrum will be required to satisfy the broadcast requirements for the 2012 Games.....It is very important therefore that any rights of use of the cleared spectrum awarded as part of the DDR be deferred until after the 2012 Games.'

13.9. Ofcom must ensure that the PMSE sector retains access rights for the cleared spectrum on a nationwide basis until after the Olympics in 2012 to ensure that there will be sufficient spectrum and sufficient equipment availability for the Olympics to be broadcast according to current production standards.

14. **Cognitive devices**

14.1. With regard to questions 11, 12 and 13 of the band manager consultation document, we refer Ofcom to section 3 of our response to the geographic interleaved award condoc.

15. **MOD-managed bands**

15.1. Ofcom are right to say that there is keen interest from PMSE users in continued access to MOD-managed spectrum. We welcome Ofcom's proposal to include any access rights to MOD bands in the licence to be awarded to the band manager and the MOD's proposal to continue to allow use of the spectrum that it manages for as long as possible. We note that the band manager might not be in place by the time the MOD addresses long-term PMSE use of its holdings to discuss possible access arrangements. We therefore urge Ofcom to continue to engage with the MOD on this matter until the band manager is in place.

16. **MPEG-4 and DVB-T226 technologies**

16.1. Ofcom have stated that they will 'continue to explore whether it is possible to identify any additional frequencies that could be used to provide carriage of these services in other regions in the period leading up to DSO. Where identified and used, such frequencies would not be available to the band manager during that period. We aim to consult further on this issue later in 2008.'

16.2. We believe that Ofcom should explain how such measures might affect the PMSE sector, specifically usability of frequencies that are currently available for PMSE use and in which PMSE applications are currently built to operate.

16.3. If those frequencies identified by Ofcom for carriage of MPEG-4 and DVB-T226 technologies in the period leading up to DSO are currently used for PMSE, then those PMSE users, who will have had little notice for eviction from these frequencies, should be

⁵⁰ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/vodafone.pdf> page 7

⁵¹ <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/orange.pdf> page 5

⁵² <http://www.ofcom.org.uk/consult/condocs/clearedaward/responses/o2.pdf> pt. 20

fully compensated for this loss of spectrum and the equipment that becomes redundant as a result.

17. **Additional digital television platforms and potential interleaved spectrum**

- 17.1. We are aware that new digital television services may be deployed in the cleared spectrum subsequent to the DDR auctions. While this is not directly relevant to the institutional arrangements of the band manager, it is relevant to the amount of interleaved spectrum that the band manager may be able to secure to licence to the PMSE sector.
- 17.2. If new television services such as a 7th multiplex are deployed in the cleared spectrum, then we presume that additional interleaved spectrum would become available. Therefore, we believe that the technical licence conditions as applied to all of the cleared spectrum must facilitate PMSE use.