



**SKY'S RESPONSE TO
OFCOM'S CONSULTATION ON NEW SPECTRUM FOR AUDIO PMSE**

1. Introduction

- 1.1 Sky welcomes the opportunity to comment on Ofcom's consultation on new spectrum for audio PMSE ("the consultation"). Sky is an extensive user of PMSE equipment in the creation of our original programming – content which makes an important contribution to the fulfilment of a number of Ofcom's duties, including ensuring the availability of a wide range of television services which are of high quality and appeal to a variety of tastes and interests, and to media plurality.
- 1.2 The reduction in available spectrum as a result of the clearance of the 700 MHz band will constitute a significant change for PMSE users over a relatively short time period. Moreover, this upheaval comes less than five years after the completion of digital switchover, a process which also necessitated large-scale equipment replacements.
- 1.3 Sky is broadly supportive of Ofcom's decision to make the 700 MHz band available for mobile use. Such a change is likely to result in a more efficient use of spectrum, and will help meet growing demand for mobile data.
- 1.4 However, the consequences of the clearance for PMSE users will have to be closely and carefully managed. Sky has expressed concern on a number of occasions in 2015 to senior Ofcom officials about the lack of any clear roadmap which will enable PMSE operations to be maintained in future.
- 1.5 While the consultation's proposals for alternative spectrum are welcome, Ofcom must urgently prioritise and lead a comprehensive industry-wide programme of work to manage and fund the transition of PMSE users into new bands. Sky would be a willing and active participant in such a programme.

2. Clearing the 700 MHz band will have a significant impact on PMSE users – particularly busy studio complexes such as Sky's

- 2.1 As the consultation acknowledges, making the 700 MHz band available for mobile use will significantly reduce the spectrum available for certain PMSE uses. The available spectrum for wireless microphones, IEMs and stage intercoms will be reduced by around 30% at the very least. Depending on finalised DTT network plans, some locations will experience an even greater loss of access.
- 2.2 Ofcom's analysis of the impact of this change focuses, in the main, on special events rather than programme making as a whole. For example, the spectrum supply use cases examined in paragraph 3.16 consider 'high demand' sporting, theatre and live music events that may not be served by sufficient interleaved spectrum following change of use of the 700 MHz band.
- 2.3 However, Ofcom's analysis fails to consider the impact of reduced spectrum availability on a busy TV studio complex such as the one Sky operates in Osterley. The impact of the 700 MHz clearance will be just as significant – if not more so – on these operations as for large special events with high PMSE demand.
- 2.4 Sky Studios currently utilises 26 UHF channels for PMSE audio equipment out of the 40 channels allocated in the 470-790 MHz frequencies. Clearance of the 700 MHz band will result in at least 13 UHF channels no longer being available for use, reducing the total available channels that current equipment can work in to 27. With DTT broadcasting in some of these channels and additional protection requirements, it is likely that less than 19 channels will remain available for PMSE use. Not

only would this would prevent any growth in PMSE use in our studio complex¹, it would also place our existing activities under severe strain even after mitigating steps were taken.

3. Ofcom's proposals for mitigation require immediate action if they are to be effective

- 3.1 The consultation examines whether PMSE audio applications could share spectrum from the 960-1164 MHz and 1529-1559 MHz bands with incumbent users on a regional basis. Of the two, Ofcom's preferred choice is the lower 960 – 1164 band because of its proximity to spectrum currently used for PMSE audio and the likelihood of its current designation remaining. Ofcom anticipates that, after applying protection for the incumbents by avoiding frequencies in the locations that they are used, the spectrum which could be made available will be sufficient to enable PMSE audio operations to continue.
- 3.2 Sky broadly agrees with Ofcom's analysis around the relative suitability of these bands for PMSE audio equipment, and their potential for mitigating the reduction in the availability of UHF spectrum. We provide some specific comments at Annex A.
- 3.3 However, identifying potential replacement bands is only the first step in what will be a significant mitigation programme. Sky is deeply concerned that additional measures which will be crucial components of effective mitigation have yet to be sufficiently advanced.

Cost of transition to PMSE users

- 3.4 The costs of replacing existing PMSE equipment will be material. At present, none of Sky's existing audio PMSE equipment has the ability to operate at the higher frequency proposed of 960-1164 MHz. Indeed, some of the equipment owned by Sky does not have the capacity to work in the UHF band that remains after the 700 MHz clearance². A significant portion of our inventory will therefore need to be replaced. Alongside these costs, Sky is likely to face additional and therefore unplanned expenditure due to associated changes in broadcast infrastructure.
- 3.5 Sky notes that in Ofcom's statement on 700 MHz, it estimated equipment replacement costs of between £13m-21m, with additional costs of £10m-13m relating to other aspects such as staff training and recruitment.
- 3.6 The consultation states that "*decisions on any funding for PMSE users affected by the 700 MHz programme are a matter for Government*"³. Sky notes that the Government announced in its Autumn Statement that £550m of funding will be made available to make the 700 MHz band available for mobile use. Furthermore, it is notable that in previous changes of spectrum use that have impacted on PMSE, Ofcom itself gave funding commitments. For instance, in deciding to clear the 800 MHz band, Ofcom committed to provide funding for the move of PMSE users from channel 69, stating that "*these commitments to minimising disruption [are] crucial to making it possible for PMSE users to continue providing important services*"⁴. Sky observes no particular difference in circumstances between the clearance of the 800 MHz band and the future 700 MHz programme, and therefore considers that a similar funding arrangement should be made available.
- 3.7 Additionally, Sky notes that this previous approach was based on the estimated life-cycle of equipment. Much of the existing equipment has only recently been purchased as a result of previous changes in spectrum allocation.

¹ Sky has plans to re-locate the current Sky News studios more centrally in our Osterley studio complex, which would necessitate a 5-10% increase in our PMSE spectrum requirements.

² Sky has shared detailed information with Ofcom previously outlining our current PMSE inventory – we would be happy to share an update of this on a confidential basis.

³ The consultation, paragraph 5.8.

⁴ Paragraph 2.3, "Clearing the 800 MHz band", Ofcom, August 2010.

European harmonisation

- 3.8 The consultation states that Ofcom has already engaged with other European administrations, sharing its proposals for alternative bands for audio PMSE. Sky considers that harmonisation is crucial in ensuring there is sufficient certainty for manufacturers, and is concerned at the impact that delays in this area could have.
- 3.9 As Ofcom would no doubt acknowledge, European acceptance will not be a straightforward process. It will require detailed, careful study of the new spectrum to ensure it is “clean enough” (i.e. free from interference) to provide the extremely high level of reliability required for PMSE operations.
- 3.10 Manufacturers are likely to require economies of scale across a number of markets in order to commit to developing new equipment that will work at higher frequencies. For this reason, greater European harmonisation with Ofcom’s proposals is crucial.
- 3.11 On the basis of previous harmonisation processes, it is reasonable to expect a period of up to two years to secure European agreement on spectrum changes (i.e. early 2018). If manufacturers conclude that there is a market, equipment re-design and approval could take another two years (i.e. with products being brought to market by early 2020), although it is possible that some of this process could run in parallel with the European spectrum agreement process.
- 3.12 Nevertheless, Sky notes that Ofcom’s proposed timetable for 700 MHz clearance may begin as early as 2019. There is consequently a significant risk that replacement equipment is not available in the necessary volumes as the clearance programme begins.
- 3.13 A flexible transitional arrangement would go some way to mitigating this risk. Sky notes the innovative approaches to dynamic spectrum allocation that Ofcom has proposed as part of its work on TV white spaces, including the use of geo location databases. Ofcom could further its duties with respect spectrum efficiency by ensuring that any cleared 700MHz spectrum continued to be made available post-2019 through a geo location database until such time as it is deployed for mobile services.

Ofcom’s mitigation programme

- 3.14 In summary, Sky has significant concerns about the feasibility of this process. We agree that at a high level the bands that Ofcom have identified are appropriate and could serve to mitigate the loss of the 700 MHz bands. But without certainty on costs, buy-in from the manufacturers, or timely European approval and harmonisation, a large-scale change programme appears challenging to deliver by the time the clearance programme commences. This puts current approaches to programme making in jeopardy.
- 3.15 Sky considers that Ofcom should commence detailed implementation work as a matter of urgency, establishing a dedicated joint group to manage the transition. Such a group should include defined workstreams, *inter alia*:
- Interference planning
 - European harmonisation
 - Manufacturer engagement
 - A funding mechanism for replacement equipment
 - Additional research and development as required
 - Transitional arrangements prior to deployment

3.16 Ofcom should adequately resource this joint group to ensure it is active in its engagement with industry and other stakeholders alike. In managing this transition, it will be vital that Ofcom and Government maintain an ongoing dialogue with PMSE users.

4. Ofcom should also incentivise the DTT platform to seek greater spectrum efficiency

4.1 Ofcom has a duty to promote the efficient management of radio spectrum. Sky considers that an appropriate policy objective would, in this context, be to explore and incentivise methods of reducing the amount of spectrum that the DTT platform currently uses as part of the wider 700 MHz programme.

4.2 For example, efficiencies could be delivered through technological developments, be that a wider adoption of the existing transmission standard of DVB-T2/MPEG 4, or new video compression standards such as HEVC. Similarly, more innovative approaches to network planning such as Single Frequency Networks could be explored as another way of increasing the amount of spectrum available for other purposes.

4.3 Sky would support any industry moves to adopt new technological standards. But there are limited incentives for multiplex operators to seek greater efficiencies, so Ofcom's involvement may be necessary to keep the UK competitive internationally. In particular, Ofcom's current policy of setting prices for DTT spectrum only on the basis of cost recovery patently does nothing to incentivise multiplex operators to adopt more efficient technology standards.

4.4 Any measures which deliver a more efficient DTT platform would go some way to alleviating the impact on PMSE. With a 30% reduction of available channels proposed as part of this move, any additional spectrum in these bands would have significant incremental benefits.

Sky

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ANNEX A – Comments on Ofcom’s analysis of possible future bands for PMSE

Overall, Sky considers that the analysis carried out by Ofcom and its consultants JCSys of possible future bands for PMSE looks sound and convincing.

However, there are a number of points that Sky considers require clarification or further consideration:

- There is confusion in terms over “channels” – it’s used for 8 MHz audio channels in paragraph 2.13, whereas in paragraph 4.37, Table 5 refers to 1 MHz channels.
- In paragraph 3.20 there is some analysis of the variation in spectral efficiency between PMSE deployments. This analysis does not note that this inefficiency is largely to avoid self-interference in larger PMSE installations through inter-modulation products.
- Paragraph 4.25 provides a brief description of the JTIDS (Joint Tactical Information Distribution System for military applications) typically being used at 10,000 feet or higher. However, given the need for ultra-reliable operation, Sky does not consider that this provides the level of certainty necessary to ensure that there will be no interference around Sky’s studio in Osterley, or central London near the Houses of Parliament.
- Safety critical applications that use the 960-1164 band are covered in paragraph 4.41, along with the proposed manual system for securing PMSE allocations which is similar to that used today. Given the recent emergence of geo-location technology it is unclear why this is not being considered, and indeed why these bands could not also be considered for TV white space deployment.