

Title:

Mr

Forename:

Bob

Surname:

Willmot

Representing:

Organisation

Organisation (if applicable):

BAE SYSTEMS

What additional details do you want to keep confidential?:

No

If you want part of your response kept confidential, which parts?:

Ofcom may publish a response summary:

Yes

I confirm that I have read the declaration:

Yes

Additional comments:

Question 1: Do you agree with our assessment of the likely costs and benefits of our proposal to license MCWSDs as a transitional arrangement? Please provide any available evidence to support your response.:

We agree broadly with Ofcom's assessment of the likely costs and benefits of unlicensed Manually Configured White Space Devices (MCWSDs).

However we feel that Ofcom may not have fully considered the interference effects between licence-exempt Automatically Configured White Space Devices (ACWSDs) and licenced MCWSDs, how these might be managed, and what the costs might be.

Have the "hidden" costs and risks of departing from the ETSI EN Standard been fully considered? Will this Standard be updated to reflect MCWSDs? If not, how will EU harmonisation be maintained into the future?

Is there a risk that allowing licenced MCWSDs might actually delay the development and introduction of ACWSD products? Although we appreciate that the proposed £1,500 licence fee would deter private individuals from using MCWSDs, so it is unlikely that they would ever become mass market products.

It would be helpful if Ofcom could indicate who they see the target users of MCWSDs might be.

Question 2: If you agree that Ofcom should allow MCWSDs to operate in the UHF TV band within the TVWS framework, how long do you believe that the licensing regime would need to be in place?:

As a military end user, we believe that a MCWSD licensing regime should be maintained permanently. TVWS is premium spectrum which can best be utilised through a mixture of licenced and unlicenced regimes.

Question 3: If you agree that Ofcom should allow MCWSDs to operate in the UHF TV band within the TVWS framework, when do you believe it would be appropriate to conduct a review to assess whether there is an ongoing need to license MCWSDs?:

See also Answer 2.

We believe that there is a lot of potential that could remain untapped unless there is a thorough review of other arrangements for utilisation of TVWS spectrum. The proposed unlicenced regime is an innovative and flexible start which frees up the TVWS spectrum for many users. Speaking as a naval/military systems company, we can see the significant potential of TVWS spectrum to deliver communications solutions. An example we are particularly interested in is communications in coastal/littoral regions. We believe that there needs to be a wide ranging review and consultation of potential applications, and the licensing regimes that would be optimal for realising such applications. A three year time frame, perhaps involving a number of Pilots similar to the TVWS ones carried out so far, might be an appropriate way to inform such a consultation.

Question 4: Do you agree with the proposed terms of the draft licence as set out in Annex 5 and as discussed below?:

Broadly yes, subject to the points raised in the following questions.

Question 5: Do you think it would be beneficial for the licensing regime for MCWSDs to cover both masters and slaves?:

The slave is defined as being under the control of a master. However if the slave can be manually configured this definition breaks down as the slave can transmit in a manual mode. We suggest that Ofcom give this further thought.

As military end-users we believe it will be essential for the licensing regime to cover both masters and slaves.

Question 6: Do you agree that our licensing regime should only apply to type A devices? :

No.

As military end users we need the flexibility to operate both fixed and mobile devices as MCWSDs. We would ask Ofcom to consider this issue further. We would be happy to consult with Ofcom on this.

Question 7: Do you agree with our approach to allow a number of MCWSDs under the control of a single licensee to be subject to a single licence?:

Yes.

However, we would ask Ofcom to consider in more detail how the limits and boundaries of a particular licence would be defined. As military end users we would be happy to consult with Ofcom on this.

We find no evidence to support Ofcom's view that the number of licences issued will be small. On the contrary, we feel that the number of licences could grow exponentially as the benefits of this premium spectrum space start to be felt amongst professional user groups. One thing we are unclear on is exactly how MCWSD parameters will be incorporated into the TVWSDBs; if there are a number of licenced MCWSDs transmitting in a particular location, will those channels not be offered as available through the TVWSDBs for unlicenced use? And vice versa? What will be the relative priorities when allocating spectrum to ACWSDs and MCWSDs -; if the latter are paying for a licence that might create an expectation of higher priority? We apologise if this has been made clear elsewhere in other publications and specifications, but it is not entirely clear to us how the licenced and unlicenced regimes will interoperate.

We would also take this opportunity to advise against moves towards TVWS 'spectrum partitioning and sell-off' as has been seen in the mobile phone areas of the spectrum.

Question 8: Do you agree that the proposal for specific licence terms will mitigate the risks posed by the use of MCWSDs?:

This is a highly complex issue that cannot be answered by a simple yes or no. Of course, licence terms can help to mitigate risks provided they can be effectively policed.

Would it become a criminal offence knowingly to enter incorrect device parameters into a MCWSD?

We agree with the licence term to have appropriate QA procedures in place; large professional organisations such as ours already have the necessary culture, infrastructure and procedures. However, these might prove burdensome to SMEs and we suggest Ofcom considers how this burden could be reduced without compromising integrity.

We agree that licence holders should be obliged to furnish Ofcom with copies of their QA-certified installation etc. information, and suggest that the licence be revoked if this is not so furnished within 90 days of the licence being granted, or the installation completed and/or the equipment going live.

Further details as to how the arrangement of providing MCWSD parameters to a TVWSDB would work are needed.

Question 9: Do you consider the proposed licence terms are appropriate and proportionate?:

Yes. We believe that the licence terms and costs are such that only professional, reputable and enduring organisations will wish to go down a licenced route. Provided Ofcom are

prepared to adopt a broad interpretation as to the extent of each 'system' covered under each licence, we believe the proposed terms are appropriate and proportionate. We envisage the 'system' as needing to cover a range from a handful of MCWSDs up to, potentially, many tens or even low hundreds of nodes spread across a wide geographic area.

Question 10: Do you have any comments on our proposal to require applicants for licences to deploy MCWSDs to supply details of their QA process on application?:

We believe this is a reasonable request which will help to ensure that only those companies with professional capabilities and a responsible attitude towards spectrum management will apply for and be able to obtain a licence.

Question 11: Do you agree with the proposed technical conditions of the draft licence?:

Broadly, yes, subject to concerns we have raised elsewhere in these responses, particularly around licenced/unlicenced regime interoperability.

Question 12: Do you have any comments on the proposed duration for this licence?:

If the Consultation Document is understood as meaning that the licence will have no end date, and will therefore be open-ended, then we believe this is appropriate as it will give organisations the confidence to commit the investment needed to develop projects.

Question 13: Do you have any comments on our proposed licence fee of £1,500:

We believe that Ofcom's cost-based approach to calculating the licence fee is appropriate. For large companies we suspect that a £1,500 licence fee would not pose a problem; it would be built into the overall project budget.

However, a lot would depend on the extent of applicability of the licence. We understand from para 5.39 that a single licence could cover the whole of the UK (subject always to manually configuring the WSD parameters in accordance with the TVWSDB). This would give large companies such as ours the flexibility to develop equipment at one location in the UK, carry out field trials at a second location, then deploy target systems at one or indeed multiple sites. But it is unclear whether a company would only need a single licence to cover multiple deployments in different geographical areas, and clarification of this is sought. We feel that the proposed licence fee may be too high for SMEs, micros and research organisations. We suggest that Ofcom consider a sliding scale based e.g. upon the EU categories for business sizes.

Question 14: Do you have any comments on our proposed five year minimum notice period for revocation for spectrum management reasons?:

There is some confusion here between what is meant by an open ended licence and the suggested five year revocation period. How can a licence be both? Is it in fact open ended, but with a five year notice period of revocation - ; this would allow enterprises that are using

the technology to switch to alternatives in an orderly manner?

Nevertheless, we would agree, in general, that a five year notice period for Ofcom to take back the spectrum is in the best interests of the UK, given the ever-changing spectrum situation.

Question 15: Do you believe there is likely to be an ongoing need for white space devices that allow some level of manual configuration? Please give reasons for your answer.:

Yes.

As a naval/military end user we are excited about the long term prospect of using MCWSDs. We believe that MCWSDs would give military users, and professional high-end civil users, much greater flexibility to deploy systems that could, for example, cover coastal and littoral areas, and extend further out towards open-ocean areas, in a seamless transition. We are also looking at schemas that would enhance and extend WSD operation, supporting e.g. multi-hop comms networks using multiple frequency channels and providing frequency diversity to improve link bandwidth, reliability and security. The ability to manually configure individual WSDs to create bigger, more flexible and optimally-configured networks, but with each WSD still operating in accordance with a TVWSDB, would we feel bring many benefits.

Question 16: Do you believe there is merit in exploring allowing enhanced operation through a licensing regime in the future and if so what additional capabilities should be allowed?:

Yes.

We are strongly of the view that allowing enhanced operation through licensing would bring many benefits to high end professional civil and military users. We are considering the design of enhanced antenna systems with high directivity which, as Ofcom rightly point out, might allow higher transmit powers to be used without causing co-existence problems. We believe that such enhanced modes should be restricted to professional developers and users; a licensing regime is an appropriate and effective way to achieve this.

The additional capabilities we believe should be allowed include, but are not limited to:

- enhanced and novel antenna systems (including, potentially, electronically and mechanically steerable and adaptive antennas);
- multi-channel grouping/bonding to increase link bandwidth;
- frequency agility;
- highly variable transmit power (up to the current limit of +36dBm)
- increased variable transmit power (above +36dBm) where the total system design is such as to mitigate co-existence problems;
- freedom to use a higher transmit power over known uninhabited regions (including e.g. the sea);
- a clear, tailored policy for operation out to and beyond territorial waters;
- full recognition of TVWSs for land, sea and air mobile vehicles.

The freedom to allow professional system designers to make use of techniques such as these would make a real difference to system capability, and maximise exploitation of TVWS opportunities.