About Arqiva

Arqiva has its headquarters in Hampshire, with other major UK offices in London, the Midlands, Buckinghamshire and Yorkshire. Arqiva operates shared radio sites throughout the UK and Ireland including masts, towers and rooftops from under 30 to over 300 metres tall as well as a number of international satellite teleports.

The company is owned by a consortium of long-term investors led by the Canadian Pension Plan Investment Board (CPPIB) and has three operating divisions: Broadcast & Media, Government, Mobile & Enterprise and Digital Platforms.

Arqiva is technology and service-neutral and operates at the heart of the broadcast and mobile communications industry. We are at the forefront of network solutions and services in an increasingly digital world. The company provides much of the infrastructure behind television, radio and wireless communications in the UK and has a growing presence in Ireland, mainland Europe and the USA.

Arqiva is a founder member of Freeview (Arqiva transmits all 6 Freeview multiplexes and is the licensed operator of 2 of them) and was a key launch technology partner for Freesat. Arqiva is also the licensed operator of the Digital One national commercial DAB multiplex.

Alongside the BBC, Arqiva's Spectrum Planning Group has played a critical role in planning Digital Switch Over (DSO).

In the communications sector, the company supports cellular, wireless broadband, video, voice and data solutions for the mobile phone, public safety, public sector, and public space and transport markets.

Major customers include the BBC, ITV, Channel 4, Channel 5, BSkyB, Classic FM, the five UK mobile operators, UKTV, Viacom, Turner Broadcasting, Metropolitan Police and RNLI.

Executive Summary

Arqiva welcome the opportunity to respond to Ofcom's consultation and is generally supportive of the proposals for TV White Space Device (WSD) requirements put forward in this consultation although we do note some issues for clarification as set out in our responses to Ofcom's questions.

Our principle concern relates directly to the potential disruption that these licence exempt services may cause to licensed users of the UHF spectrum, i.e. Broadcast, PMSE and Mobile services, and in particular broadcast DTT reception. Whilst we recognise that coexistence issues will be the subject of a separate and later consultation by Ofcom we emphasise that any decisions taken to introduce White Spaces services to the interleaved spectrum in the UHF band should be based on the objective of avoiding harmful interference to existing licensed users. Whilst the device proposals put forward by Ofcom as part of this consultation seem sensible, subject to the minor issues that we raise being addressed, there still remains uncertainty about the coexistence arrangements that will be implemented to allow white space services to be introduced and hence we reserve our position on this aspect until we understand further Ofcom's proposals in the consultation planned later in 2013.

Finally, we note some reservations with regard to the relevance of the Impact Assessment provided in the consultation document and most notably its reflection on previous economic assessments which were prepared prior to recent studies[1] undertaken by the BBC and Arqiva to determine the actual availability of White Space spectrum. Furthermore, it would seem inappropriate to judge the future viability of White Space services in isolation of the coexistence framework which Ofcom will consult on later in 2013.

Arqiva's detailed responses to Ofcom's consultation questions are set out below;

[1] http://stakeholders.ofcom.org.uk/binaries/consultations/uhf-strategy/statement/BBC_Arqiva_preliminary.pdf.

Question 1: Do you agree with our approach to defining the various categories of WSDs?

Arqiva are supportive of the arrangements proposed by Ofcom although we wish to raise a number of issues.

Section 5.11 – Slave Horizontal Geo-location:

Slave devices are not required to provide mandatory geo-location information to the database in order to calculate EIRPs for devices. For slaves that do not geo-locate, the data-base will calculate the master device coverage area. It will be assumed that associated slave devices can operate at any location within this calculated coverage area and the EIRP of the slave devices will depend upon the most restricted DTT pixel within the coverage area. However in order to accurately calculate the coverage area, and in addition to the existing mandatory parameters which must be exchanged between the master device and the database (for example: horizontal geo-location, device type, emission class and radio or technology ID) two further technical parameters must be identified. These should include the slave WSD antenna gain and the modulation mode. If the modulation mode is hierarchical, adaptive or not known, then the most robust modulation mode should be used in order to calculate the maximum coverage of the master device.

Section 5.12 – Vertical geo-location:

Vertical geo-location capability is optional for both the Master and Slave devices. When vertical geo-location is not declared by the WSD, a conservative height is assumed dependent upon the device type reported by the master WSD to the data-base. Type A devices are defined to have an external fixed antenna, Type B can be a combination of mobile/portable or fixed, and either in-door or outdoor with an integrated antenna. However it is not clear from the Consultation document what the explicit reference geometries for each type of device would be. It would be sensible to assume a conservative reference geometry of 10m or clutter height for Type A devices. Furthermore, it is not clear what should be assumed for the so-called “relaxed” reference geometry for type B devices.

With regard to White Space Device categories, Ofcom have included definitions in the consultation document for Type A and Type B devices, on which we have the following comments:

The definition of Type A devices is clear relating as it does to any device where the antenna is at a fixed, outdoor location (e.g. on a building or external structure)

The double negative terminology used by Ofcom for Type B devices introduces a degree of ambiguity in the definition which makes it more difficult to be definitive about the adequacy of Ofcom’s proposed arrangements for managing interference from these devices.

It would be helpful therefore if these definitions could be reviewed by Ofcom to ensure that less ambiguous and more understandable terminology is used in the definition of Type B devices and hence a fair judgement made about the appropriateness of the proposals.

Section 5.18 states that the device type must be declared by the manufacturer. It is difficult to envisage how the device manufacturer will be able to declare this as they can not be certain whether the antenna will be mounted on a moving or non-moving platform or will be located indoors or outdoors.

Question 2: Do you agree with our proposed sequence of operations for WSDs?

Ofcom's approach seems sensible and we are supportive of the proposed sequence of operations.

Question 3: Do you agree with our proposed additional operational requirements for master WSDs?

We are supportive of Ofcom's proposed additional operational requirements for master WSDs but note the following issues.

Multi-channel operation (sections 5.61 to section 5.63):

Arqiva is supportive of Ofcom's approach to determining the EIRP limits for WSDs operating over multi UHF channels. However existing protection ratio values used for the calculation of the EIRP of the WSD are based on single UHF channel occupancy. We expect that the protection ratios for contiguous multi-channel WSDs will be similar to single UHF channel devices; however no tests have been conducted to determine protection ratios when a single WSD is configured to operate over non-contiguous multi-UHF channels. Arqiva requests that appropriate multi-channel protection ratio tests are undertaken which are configured to establish whether modified protection ratios are needed in order to calculate WSD EIRPs.

Security for the Master Device and the White Space Database (sections 5.68 to 5.70)

It would appear that the security of the connection between the Master WSD and the WSD database may well be adequately protected if the IETF-PAWS proposals currently under development are adopted.[2]. This task group is expected to publish its initial draft specifications in the spring of 2013. The protocol will define both the database discovery mechanism, and the security mechanisms required on the master WSD to WSD database link to ensure that security between the two entities is not compromised. We would however ask that Ofcom review the proposals currently under development and advise whether they believe that they are appropriate for the UK.

Security mechanisms between the Master and Slave devices

Arqiva expects that a number of user-application specific WSD technologies will be in use with each technology varying in the way that it secures the data exchange between the Master and its associated Slave devices. Whilst Arqiva accepts that the methods of security will vary dependent upon the technology, we seek to further understand how Ofcom will determine if the technology specific security measures are appropriate in order to adequately

[2] IETF-PAWS (Internet Engineering Task Force – Protocol to Access White Space Database) communication protocol

protect the data on the bi-directional wireless link between the master and slave devices. Arqiva also seeks to understand how the proposed measures will be tested (sections 5.121 to 5.123 draft VNS).

Question 4: Do you agree with the proposed additional operational requirements for slave WSD?

We are supportive of Ofcom's proposed approach for additional requirements for slave WSDs but suggest that the obligation on device manufacturers in 5.72 should explicitly require that the user cannot modify the RF performance or characteristics of the slave device independently from the WSD data-base.

Question 5: Do you agree with the proposed device parameters, operational parameters and channel usage parameters?

Arqiva note the same concerns here as highlighted in our response to Question 1 in regard to Section 5.12 – Vertical geo-location.

Question 6: Do you agree with our approach of implementing the requirements in the example SI and the draft IR and VNS?

Ofcom's approach seems sensible and we are supportive of the approach proposed for implementing the requirements in the example SI and the draft IR and VNS although we have some reservations with regard to the relevance of the Impact Assessment provided in the consultation document and most notably its reflection on previous economic assessments which were prepared prior to recent studies[3] undertaken by the BBC and Arqiva to determine the actual availability of White Space spectrum. Furthermore, it would seem inappropriate to judge the future viability of White Space services in isolation of the coexistence framework which Ofcom will consult on later in 2013.

[3] http://stakeholders.ofcom.org.uk/binaries/consultations/uhf-strategy/statement/BBC_Arqiva_preliminary.pdf.