Ofcom Consultation – Enabling Spectrum Sharing in the Upper 6GHz Band

'Ofcom is proposing to add the upper 6 GHz band (6425-7070 MHz) to its Shared Access licence framework for low-power indoor use.

Licences would cover the full band for an area within a 50m radius of a central point, and use would be limited to indoor-only, with a maximum power limit of 250mW EIRP. '

Introduction

Ofcom has focused the provision of spectrum access to Mobile Operators and WiFi providers over the last 20 years. It is important that Ofcom does not lose sight of the spectrum access needs of other platforms / systems, e.g. Energy Network Operators, Broadcasting, Transport, PMSE, etc. To this end we are very supportive of the work underway in Ofcom's 'Spectrum for Utilities' study and our response centres on the importance of ensuring that appropriate spectrum access is afforded to other users in order to support Government policy, i.e. the 'Net Zero' transition.

Background – JRC Limited

JRC Ltd is a wholly owned joint venture between the UK electricity and gas industries specifically created to manage the radio spectrum allocations for these industries used to support operational, safety and emergency communications. JRC manages blocks of VHF and UHF spectrum for Private Business Radio applications, telemetry & tele-control services and network operations. JRC created and manages a national cellular plan for co-ordinating frequency assignments for a number of large radio networks in the UK. As critical systems users, the Joint Radio Company (JRC) welcomes the opportunity to respond to this consultation on behalf of the electricity and gas network operators. JRC highlights that communication networks are dependent on access to resilient and robust electricity supplies. As the smart grid evolves, existing monitoring and control systems will need to be significantly expanded and extended. This expansion in the operational communications needs of the energy utilities will require access to additional spectrum.

JRC Response

JRC welcomes the opportunity to respond to this consultation around sharing of the upper 6GHz fixed links frequency band for provision of enhanced WiFi or LTE (5G) services. JRC is a supporter of Ofcom's initiatives to improve connectivity for all – especially in relation to improved economic output for UKPLC, home working and associated climate impact of reduced need for commuting etc.

JRC is concerned that the proposals to share the 6GHz fixed links band with WiFi / LTE services has not been fully considered or technically assessed from the perspective of likely impact to performance degradation of incumbent fixed links users – including JRC's Members. Although the proposals for sharing indicate a limited output power and indoor only options, in practise it is unlikely that this will be able to be policed effectively given the large number of devices which will inevitably be in use and the potential for higher power units to be imported unofficially to the UK market. *We suspect that previous attempts at 'light licensing' approaches (including nominal registration fees and an obligation to notify Ofcom of device locations) in other bands such as 5.8 GHz and E / V band have been relatively ineffective at capturing and maintaining accurate data about actual deployments*.

JRC's Members depend on a modest number of upper 6GHz fixed links (23 in total) to provide high capacity backhaul transmission services connecting critical national infrastructure (electricity substation equipment and associated plant) in remote locations throughout the UK. Any degradation

to the performance of these links is likely to have a detrimental impact on the power industry's capability to monitor and control its assets with subsequent impact on operational reliability and restoration times in the event of faults.

JRC encourage Ofcom to consider the following two actions before introducing the sharing arrangements proposed;-

i) A technical study (including on site measurements) of actual impact on upper 6GHz fixed link performance of the proposed WiFi / LTE hardware positioned at a variety of distances and locations from fixed link end points. This could include activity in the lower 6GHz band which is already open for sharing – the findings could be used to qualify the applicability of Lower 6 GHz interference studies to the upper 6GHz range.

ii) An option to include exclusion zones around fixed link end points limiting the ability to deploy 6GHz WiFi hardware in close proximity (to be defined) to fixed links. The specifics of any exclusion zone to be informed by the findings of item (i)

JRC note that significant work has been completed in North America by the Utilities Telecommunications Council who represent the interest of U.S. utilities in spectrum related matters. Utility companies in the USA make very significant use of 6GHz fixed links and have repeatedly raised concerns with the FCC around the introduction of WiFi systems in this band. The dialogue between UTC and FCC has been backed with detailed technical reports and studies. We encourage Ofcom to review this body of work which includes detailed technical analysis and discussions at a political level.

www.utc.org/6ghz

It is interesting that at the same time as Ofcom is continuing its work item assessing the future additional spectrum needs for utilities there is a proposal here to potentially compromise the ongoing security and useability of one of the existing fixed link allocations on which the Energy Networks operational integrity depends. JRC's Members are uniquely affected by any changes to 6GHz as they are located on land rather than off shore (in the case of North Sea Oil and Gas platforms) and as such are more likely to be impacted by Wifi installations in relatively close proximity to existing links. Conversely, offshore installations are significantly less likely to be affected by Wifi devices.

Answers to Specific Questions

1. *Do you agree with our proposals to add the 6425-7070 MHz band to the Shared Access framework?*

   No, JRC does not currently believe that the proposals by Ofcom will provide adequate protection to incumbent users of fixed microwave links. In the case of JRC managed links in the upper 6 GHz band, these are utilised to provide backhaul transmission from critical national infrastructure locations and any degradation of performance could have significant impact on the stability of the energy networks.

2. *Do you have any comments on potential uses for this licence?*

JRC is aware that the most likely use of the shared spectrum will be for either WiFi based services or 5G services based on LTE protocols developed by 3GPP. In either case these new services represent a potential threat to the performance of existing fixed links. Ofcom itself recognises that the final decisions around use of the band will not be concluded until post WRC23 and could be subject to findings of CEPT interference studies. Although Ofcom indicates potential ways to change the licensing process for shared access in the upper 6GHz band at a later date this would likely be very difficult if not impossible to impose in any meaningful way. Ofcom acknowledges that the opening of the upper 6GHz band will allow UK consumers and industry to gain access to a wide range of low-cost equipment which is available on the global market. This is likely to fuel the proliferation of a very large number of devices which, once deployed, will be very difficult to displace.

3. *Do you have any comments on our proposed licence conditions, licence fee or minimum separation distance?*

JRC's main concern is with the protection of existing fixed links. As noted above JRC does not have confidence that a licensing regime of the type suggested will offer any real protection to incumbent users and as has been noted we encourage Ofcom to consider the role of exclusions zones to protect incumbent fixed links from disruption. We question whether the suggested annual fee of £320 will be respected (paid) by many users of the new equipment (regardless of whether it is WiFi or LTE-based).

4. *Do you have any comments on our technical analysis?*

The technical analysis indicates that in certain circumstances it would be possible for new devices to impact the performance of incumbent systems either via degradation of fade margins (reducing availability) and / or de-sensitizing receivers. We accept that the highly directional properties of parabolic antennas used in the upper 6 GHz band provides a certain level of spatial protection from other users but we also note for critical national infrastructure purposes the fixed links are often designed to operate at 99.999% availability – achieved through a combination of precise engineering and redundant 'hot standby' systems. Any deviation from 99.999 % availability is unacceptable. We also note that the extrapolation of interference probabilities in the lower 6GHz band may not be entirely valid. The lower 6GHz band has only been open for sharing for a short period and we anticipate that there is a lack of 'real world' evidence at this stage. Given Ofcom's acknowledgement that further discussions and technical compatibility work will take place at WRC 23 and in CEPT, JRC suggests that it would be prudent for Ofcom to await the outcome of these work items before opening the upper 6GHz band to shared use.