Ofcom Statement & Consultation

Approach to future mobile use in high density areas and incumbent users in this band

1.0 Executive Summary

JRC and its Members welcome the opportunity to respond to this consultation and as critical system operators JRC Members depend on fixed links, including 6 GHz, and as such are concerned with Ofcom's proposals to expand access to commercial mobile and WiFi in the band. The focus of JRC's response is summarised below;

Whilst we recognise the demand for additional spectrum for mobile services, and the desire to harmonise with Europe the implementation of mobile services in the band, JRC Members operate a number of fixed links within the 6 GHz band for the monitoring and control of the energy network. As the industry moves towards the Clean Power 2030 goals, the need for greater visibility of the assets and enhanced operational control will become even more critical, and the fixed links network is a fundamental part of that operational control network.

We disagree with Ofcom's initial assessment that the benefit to citizens and consumers of using Upper 6 GHz for mobile in high density areas is likely to be greater than that of fixed links and we disagree with the proposal to clear all 88 of the high density areas from fixed link use as currently identified. The power provided by the energy networks are an essential enabling service for new technical developments and services, faster and secure energy connections support growth across different sectors of the UK economy, but in order to deliver that energy there is a requirement for greater visibility and control of the energy networks' equipment which itself requires the communication service provided by the existing fixed links.

In many cases the fixed links identified in Ofcom's analysis provide tele-protection services for the energy networks infrastructure; this is a system designed to ensure the safe operation of the energy infrastructure, essential to protect equipment in the event of a fault. Teleprotection is the 'nervous system' of the energy networks, integrating protection relays and mission-critical communication networks to detect faults and instantly trigger circuit breakers. This rapid isolation is vital for preventing cascading power outages, protecting equipment, maintaining grid stability and ensuring the reliable provision of energy for UK consumers and businesses.

Teleprotection has the most stringent availability and latency requirements of the energy network operational telecommunications circuits, and fixed links are used where suitable fibre circuits are not available or economical. As detailed in the detailed confidential analysis submitted separately by JRC, we have planned links at 6 GHz because this was the only frequency available which could provide the required availability for the length of path that the equipment operates between. However, we believe that in some areas the incumbent fixed link and the incoming mobile services could be more closely coordinated such that the two services could co-exist as detailed in our previously supplied confidential assessment.

We welcome Ofcom's proposal to continue to make the band available for future fixed link use outside the high density areas, as this will maximise the benefits from use of this spectrum for multiple users. However (as detailed in our confidential analysis, previously shared, of the impact of Ofcom's proposals on key CNI fixed links) we are also asking Ofcom to look further into how some incumbent links and proposed mobiles services could co-exist in some key areas, where the current coexistence assumptions appear to be driven by either conservative approaches or unrealistic terrain assumptions.

2.0 - Background - The Joint Radio Company (JRC, www.jrc.co.uk)

Joint Radio Company Ltd is a wholly owned joint venture between the UK electricity and gas network operators created to manage the radio spectrum allocations and coordinate planning to support operational, safety and emergency communications.

Communications are a fundamental part of the energy networks; they provide the visibility required for monitoring and control of the equipment, which is essential for the safe and secure control of the energy network as a whole. Low carbon generation is now overtaking traditional coal and gas, this creates increased complexity in the network, as more active participants contribute to the network, but also enables a new level of flexibility. However the low carbon generation also delivers an increased layer of unpredictability and new challenges in connectivity. Greater visibility to allow effective monitoring and control is key to the resilient and secure energy provision from generation through to point of consumption. Operational telecommunication enables the monitoring and control which is essential to ensure the resilience, security and stability of the energy network.

JRC manages blocks of VHF and UHF spectrum for Private Business Radio applications, telemetry & telecontrol services and network operations. JRC created and manages a national cellular plan for co-ordinating frequency assignments for several large radio networks in the UK.

The VHF and UHF frequency allocations managed by JRC support telecommunications networks to keep the electricity and gas industries in touch with their field engineers and remote assets. These networks provide comprehensive geographical coverage to support installation, maintenance, operation and repair of plant in all weather conditions on 24 hour/365 days per year basis.

JRC's Scanning Telemetry Service is used by radio based Supervisory Control And Data Acquisition (SCADA) networks which control and monitor safety critical gas and electricity assets throughout the country. These networks provide resilient and reliable communications at all times to unmanned sites and assets in remote locations to maintain the integrity of the UK's energy transmission and distribution. JRC also manages microwave fixed link and satellite licences on behalf of UK energy networks.

JRC supports the European Utility Telecommunications Council's Radio Spectrum Group, and participates in other global utility telecom organisations. JRC participates in European Telecommunications Standards Institute (ETSI) working groups developing new radio standards, and European telecommunications regulatory groups and workshops.

JRC works with the Energy Networks Association's is an active member of the Energy Networks Association Strategic Telecoms Task Group and is an acknowledged knowledge source for cyber-security in respect of radio networks.

Fixed links have been utilised for many decades in order to provide backbone transmission capability to support existing, application specific networks such as SCADA, Scanning Telemetry and push to talk voice. Increasingly, as these multiple applications convene in the IP domain, growth in backhaul bandwidth requirements are essential. So to is the number of links required, as connectivity is required to push further and further towards the periphery of the energy networks. In addition fixed links are used to provide teleprotection services which are circuits designed to enable rapid isolation of the energy networks in the case of a fault which is vital for preventing cascading power outages, protecting equipment and maintaining grid stability.

As the energy networks develop to meet the demand for greater carbon neutral generation, and as demand increases, there will be a requirement for the introduction of more fixed links in order to provide the necessary backhaul and protections circuits necessary to manage these more unpredictable generation sources. .

3.0 Detailed Responses to Questions

Question 1: Do you agree with our proposed set of 88 high density areas for 6 GHz authorisation? If you disagree, please provide your reasoning and evidence.

Q 1. JRC Response

Confidential? No.

Whilst we recognise the demand for additional spectrum for mobile services, and the desire to harmonise with Europe the implementation of mobile services in the band, JRC Members operate a number of fixed links within the 6 GHz band for the monitoring and control of the energy network. As the industry moves towards the Clean Power 2030 goals, the need for enhanced operational control will become even more critical and extend further to the edge of the network and in more rural areas, and the fixed link network is a fundamental part of that operational monitoring and control network.

With regards to the 88 high density areas proposed for U6 GHz mobile authorisation, within some of the areas, there are a number of fixed links which support the monitoring and control of critical national infrastructure including teleprotection services required for the safe delivery of energy in these areas, ensuring energy security and resilience for UK consumers and businesses.

The power provided by the energy networks are an essential enabling service for new technical developments and services, but in order to deliver that energy there is also a requirement for the visibility of the energy network equipment which itself requires the communication service provided by the existing fixed links.

Teleprotection is the 'nervous system' of the energy networks, integrating protection relays and mission-critical communication networks to detect faults and instantly trigger circuit breakers. This rapid isolation is vital for preventing cascading power outages, protecting equipment and maintaining grid stability.

We believe that in some areas the incumbent fixed links and the incoming mobile services could be more closely coordinated such that the two services could co-exist. In many cases the areas identified are excessively large and fall outside the key populated areas where we would anticipate the demand for the mobile service may arise. We have provided additional confidential analysis to support our assessment with regards to specific areas and believe that with careful coordination, the two systems would be able to co-exist.

Question 2: Do you agree with our proposal to clear fixed links from the Upper 6 GHz band in and around high-density areas, and to leave the band open to new fixed link licence applications outside of high-density areas, subject to coordination??

Q 2. JRC Response

Confidential? No.

We disagree with Ofcom's initial view that the benefit to citizens and consumers of using Upper 6 GHz for mobile in high density areas is likely to be greater than that of fixed links. Communications

are a fundamental part of the energy networks; they provide the visibility required for monitoring and control of the equipment, which is essential for the safe and secure control of the energy network as a whole. Operational telecommunication enables the monitoring and control which is essential to ensure the resilience, security and stability of the energy network which underpins all domestic and industrial activities across the UK. Secure reliable and affordable energy provision is a fundamental enabler of UK economic growth.

The links identified are typically long path, high availability, low latency and high bandwidth links, typically used for tele-protection and services supporting restoration of the electricity network in the event of a national emergency. These can only realistically be replaced with frequencies in a similar part of the spectrum. Frequencies above 13 GHz do not provide the required availability for these high capacity, low latency links over these long paths due to the increased loss due to rain fade and increased latency as a result of the need for additional hop sites.

We do welcome Ofcom proposal to keep the band open for new fixed links outside of high density areas particularly in light of the fact that as the energy networks become more complex and reach further into rural and remote areas as more low carbon generation is connected, there will be the need for additional connectivity to those networks to ensure they can operate safely and afford the energy system the flexibility required for an affordable and resilient future.

Question 3: Do you agree with the approach we have set out to identify the links which will be affected by the proposed revocation?

Q 3. JRC Response

Confidential? No.

We believe that Ofcom's method of identifying the links which will be affected and likely to be revoked is overly conservative in some cases.

Some of the Ofcom published HD areas are covering high ground well outside the likely deployment areas for the mobile service and as a result are producing some revocation choices that are extremely conservative and potentially preventing coexistence of some important links used for CNI purposes that have no technical or economic alternative.

In many cases the fixed links identified in Ofcom's analysis are providing teleprotection services which is a system designed to ensure the safe operation of the energy infrastructure, essential to protect equipment in the event of a fault. Teleprotection is the 'nervous system' of the energy networks, integrating protection relays and mission-critical communication networks to detect faults and instantly trigger circuit breakers. This rapid isolation is vital for preventing cascading power outages, protecting equipment and maintaining grid stability.

Our analysis in a number of the areas is that the incumbent fixed links required to enable energy provision in the areas should be able to co-exist with the incoming mobile service with careful coordination and detailed planning. We have submitted separate confidential analysis supporting our views and we ask Ofcom to take account of our technical analysis when developing further their coexistence approaches. Given the critical role played by these links in meeting the operational

needs of energy networks and ensuring energy security for UK citizen and consumers, we are asking Ofcom to reconsider their proposals in light of our response and additional technical analyses.

Question 4: Do you agree with our proposal to remove access to the frequencies 7110–7125 MHz for PMSE use, but to retain the option of allowing users to "borrow" spectrum from the Upper 6 GHz band for occasional major events?

Q 4. JRC Response

Confidential? No.

No Comment.

Question 5: Do you agree with our proposal to require mobile base stations to protect RAS usage of the band at the levels specified?

Q 5. JRC Response

Confidential? No.
No Comment.

Question 6: Do you have any comments on how we should manage coexistence between mobile and any other users in the Upper 6 GHz band (i.e., RAS, EESS, SRDs, FSS and MOD use)?

Q 6. JRC Response

Confidential? No.

No Comment.

Question 7: Do you have any comments on our assessment of the impacts of our proposals (to the extent not covered by previous questions)?

Q 7. JRC Response

Confidential? No.

As stated in Question 2 above, we disagree that the benefit to citizens and consumers of using Upper 6 GHz for mobile in high density areas is likely to be greater than that of fixed links.

The UK energy system is undergoing a period of profound change, with low carbon generation now overtaking traditional coal and gas generation and an increasing number of active distributed resources contributing to the grid. This changing system introduces new challenges; with increased complexity in the network, new levels of flexibility and new risks around unpredictability/volatility of supply; visibility of network resources and the ability to control and actuate flexibility, are critical to the running of the energy system. And there is no visibility nor control without communication solutions. Operational telecommunication enables the monitoring and control which is essential to ensure the resilience, security and stability of the energy network.

Domestic and industrial activity across the UK relies on the power provided by the energy networks and that power is an essential enabling service for new technical developments and services supporting economic growth in key sectors identified by the Government 10 years Infrastructure strategy (such as data centres), but in order to deliver affordable energy where it is needed, there is also a requirement for operational communications to provide the visibility of the energy network infrastructure that is essential to ensure the safe, secure and resilient delivery of energy from the point of generation to the point of consumption, whilst ensuring networks are used as efficiently as possible.

Question 8: Do you have any comments on our Equality impact assessment?.

Q 8. JRC Response

Confidential? No.

No comment.

Question 9: Do you have any comments on our Welsh Language impact assessment?

Q 9. JRC Response

Confidential? No.

No comment.

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