

Ofcom Call for Inputs

Expanding Spectrum Access for Satellite Gateways (Q / V and E bands)

1.0 Executive Summary

JRC welcomes the opportunity to respond to this call for input on behalf of the UK Energy Network Operators who make significant use of fixed links (including the 38 GHz band) for a range of mission critical operational telecommunications services to ensure the operational integrity of critical national infrastructure. There is expanding use of microwave fixed links to facilitate enhanced real time connectivity and control of the Energy Networks which in turn will facilitate 'Net Zero' transition. Terrestrial Fixed links have a unique role in the toolbox of connectivity options available to the Energy Network Operators - the properties of such links have both technical and financial characteristics which make them extremely useful for hard-to-reach locations – where the provision of highly available low latency communication by other means would be uneconomic and would require extremely protracted implementation timescales. To this end, JRC encourages Ofcom to protect the performance characteristics of existing and future fixed links in the 38 GHz band and to ensure thorough independent interoperability tests have been undertaken before the new services are introduced.

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

Joint Radio Company 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 & 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 industry plant and equipment throughout the country. These networks provide resilient and reliable communications at all times to unmanned sites and plant in remote locations to maintain the integrity of the UK's energy generation, transmission and distribution.

JRC also manages microwave fixed link and satellite licences on behalf of the utility sector.

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 Future Energy Networks Groups assessing ICT implications of Smart Networks, Smart Grids & Smart Meters, is an active member of the Energy Networks Association Strategic Telecoms Group and is an acknowledged knowledge source for cyber-security in respect of radio networks.

Fixed (Microwave) 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, increases in backhaul bandwidth requirements, as provided by fixed links in this band, are essential. So too is the number of links required, as connectivity is required to push further and wider

towards the periphery of the energy networks. As noted in other dialogue with Ofcom, JRC & ENA-STG are striving to gain access to additional dedicated radio spectrum to allow the deployment of a Private LTE (pLTE) based smart grid connectivity FAN (Field Area Network)¹. The eventual deployment of such a network will require the introduction of more fixed links in order to provide backhaul from the RAN back to the core.

The obligations placed upon energy utilities by Ofgem require extremely high availability of services to end users (average power outage duration for 2023 in the UK is 32 minutes – 99.994 % availability). Similar high availability levels are a key design criterion for the communications networks and operational telecommunications systems which are used to monitor and control the remote network assets making up the UK's energy system. It is perhaps noteworthy that JRC members do not make use of the 50 GHz 70 GHz and 85 GHz bands due to their incompatibility with high availability requirements and 'light licensing' approach which offers insufficient protection against interference. Noting the above obligations JRC encourages Ofcom to ensure that the integrity of fixed links in the 38 GHz band is preserved to avoid regulatory failure.

¹ Call for Input: Potential spectrum bands to support utilities sector transformation <https://www.ofcom.org.uk/consultations-and-statements/category-1/potential-spectrum-bands-to-support-utilities>

3.0 Detailed Responses to Questions

- Q 1. Do you plan to use Q/V and/or E bands for gateways in the UK? Please provide further detail as follows:
- Which bands are you planning to use?
 - When and for what purposes?
 - How much spectrum do you anticipate will be needed in each band referred to in 1a) (indicating the total uplink and total downlink spectrum required)? Please provide evidence to support your capacity estimation.
 - If you anticipate needing access to both Q/V and E band please explain the reasons. Provide supporting evidence explaining how you determine how much spectrum will be required for future gateways, and how this demand changes over time.
 - What factors would influence your decision to place one or more gateway(s) in the UK? How many gateway locations do you anticipate needing in the UK for each of the frequency bands referred to in 1a). Why?

Q 1. JRC Response

Confidential? No.

JRC Members do not intend to operate gateways in any of these bands but are concerned that the sharing of spectrum with satellite services in the fixed links band 37.5-39.5 GHz could result in interference to, and degrade the performance of, existing terrestrial fixed links on which our Members depend for the operation of the UK's energy networks. To this end if Ofcom do in due course seek to introduce satellite gateways into this frequency range, it is essential that every effort is made to ensure appropriate protection of the fixed links on which the energy networks depend.

- Q 2. To help us understand the services that the gateways will support, please provide the following information:
- Which downstream services do you anticipate serving with Q/V or E band gateways deployed in the UK?
 - For each service in your answer to 2a) please explain which, if any, of these services will be available in the UK and who they would serve.
 - For your response to 2b) please indicate when these services are expected to become available globally and to UK consumers.
 - Are gateways in the UK required in order to serve UK consumers? If not, do you have plans for gateways (which will use Q/V/E) in other countries, which could be used to serve the UK?
 - Do you plan to deploy gateways in the UK to serve consumers in countries other than the UK? If yes, please provide reasons for this approach.
 - Are there any other identifiable benefits to UK people and businesses of locating gateways in the UK? If so, please provide evidence of this.

Q 2. JRC Response

Confidential? No.

No Comment

- Q 3. Do you have any information on gateways that are planned to be deployed in the UK in the Q/V bands including technical parameters? If so, please provide details.

Q 3. JRC Response

Confidential? No.

No Comment

Q 4. Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in the Q/V bands? If so, please provide details.

Q 4. JRC Response

Confidential? No.

It is crucial that introduction of satellite services (uplink and downlink) in 37.5-39.5 GHz is only undertaken once a thorough process of assessing the impact on terrestrial systems has been completed and an appropriate protection regime is established for the incumbent fixed links on which the Energy Networks depend for the operational integrity of the UK Energy system.

Q 5. Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in the Q/V band and adjacent bands, as appropriate? If so, please provide details.

Q 5. JRC Response

Confidential? No.

Coexistence analysis with incumbent fixed links needs to be undertaken in detail – including thorough measurement on actual systems. JRC would recommend that this includes a wide range of deployment scenarios and angular variations to take account of interferer / victim interaction on antenna sidelobes and with varying degrees of inclination to the horizon.

Q 6. What are your views on enabling NGSO gateway earth stations to access the 51.4 – 52.4 GHz band before WRC-27 concludes?

Q 6. JRC Response

Confidential? No.

No Comment

Q 7. What are your views on initially enabling access to 37.5 – 40.5 GHz for gateways, with a later consideration of the 40.5 – 43.5 GHz frequency range? Do you consider 42.5 – 43.5 GHz to be usable in the uplink?

Q 7. JRC Response

Confidential? No.

As noted in our response to Q5, access to 37.5 – 40.5 GHz should not be granted until the potential interference potential with respect to terrestrial fixed links is fully understood, and any necessary mitigation steps introduced.

Q 8 Do you have any information on gateways that are planned to be deployed in the UK in E band including technical parameters? If so, please provide details.

Q 8. JRC Response

Confidential? No.

No Comment

Q 9 Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in E band? If so, please provide details.

Q 9. JRC Response

Confidential? No.

No Comment

Q 10. Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in E band and adjacent bands, as appropriate? If so, please provide details.

Q 10. JRC Response

Confidential? No.

JRC members do not operate any fixed links in E band.

Q 11. What are your views on considering enabling gateways to use E band before WRC-27 concludes?

Q 11. JRC Response

Confidential? No.

No Comment

Q 12. Are there any other points that you deem would be helpful in our consideration of Q/V and E bands for future gateways? In providing your response, please include as much supporting evidence as you can

Q 12. JRC Response

Confidential? No.

Although it is important for UK citizens to benefit from developments in next generation satellite technology, it is important that the introduction of new technology / platforms is not undertaken too hastily and without the appropriate due diligence around the wider impact and detriment to existing systems / capability – particularly to the incumbent use of the 38 GHz fixed link band which is actively deployed to ensure the operational integrity of the UK energy networks. To this end, we encourage Ofcom to ensure that thorough independent interoperability tests have been undertaken and an appropriate coexistence regime is established before the new services are introduced to avoid a regulatory failure.