

Ofcom Call for Inputs

Improving Mobile Connectivity from the sky and space

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 narrow band terrestrial systems within VHF Band 148.0 to 149.0 MHz for a range of mission critical operational telecommunications services, to ensure the operational integrity of critical national infrastructure.

Sharing studies in 2002 demonstrated that the proposed MSS satellite services were unable to reliably detect and avoid the incumbent terrestrial services within the VHF band and the then Minister of State for E-Commerce and Competitiveness rejected any proposed use of the 148.0 - 149.0 MHz band for MSS satellite services at that time. Since the terrestrial services on which the Energy Network Operators depend are still in operation, the effective ban of MSS satellite services in the 148.0 - 149.0 frequency range should be retained.

In addition, Energy Networks make significant use of the Maritime Mobile allocations managed by Ofcom in the 156.7625 – 156.7875 MHz, 156.8125 – 156.8375 MHz, 161.9625 – 161.9875 MHz and 162.0125-162.0375 MHz bands for critical national infrastructure communication and control. We encourage Ofcom to ensure appropriate compatibility studies have been undertaken to protect those incumbent users prior to further consideration of frequency bands for the deployment of MSS services.

Whilst, D2D type services in remote parts of the UK could offer supplementary connectivity to that provided by existing terrestrial networks, it is not possible to estimate any potential benefit to Energy Network Operators until the service has been established and is suitably mature to demonstrate its performance, availability, security and operational resilience to allow an informed decision.

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.

VHF narrow band terrestrial systems have been utilised for many decades in order to provide application specific networks for both voice and data services. These systems are deployed over large geographical areas of the UK, often providing a critical service where existing mobile networks are not available. 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 would enable the migration of these legacy systems over time.

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. Noting the above obligations JRC encourages Ofcom to ensure that the integrity of existing terrestrial based operational services within the MSS bands under consideration are protected 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. What is the market opportunity for D2D services? What is the nature of the benefits that could be delivered to people and business in the UK and what do you estimate the magnitude of the benefits to be?

Q 1. JRC Response

Confidential? No.

Although the availability of D2D services in remote parts of the UK may offer supplementary connectivity, it is not possible to estimate any potential benefit to utilities until the services have been established and the service offering is suitably mature to provide appropriate comfort over its performance, availability, cost and reliability.

Q 2. Are there any wider citizen or societal benefits that D2D services could deliver that the market might not deliver? What is the nature of these benefits and why might the market fail to deliver them? For example, what role could D2D have in improving the availability of 999 services in the UK?

Q 2. JRC Response

Confidential? No.

Whilst D2D services may offer an opportunity for connectivity in the case of a widespread failure of terrestrial networks (for example in a storm or disaster scenario), the capacity of the satellite service is not yet proven to be able to cope with the potential demand that would result from a total or partial loss of terrestrial solutions.

Q 3. Subject to suitable regulatory frameworks being in place, do you have an interest in offering D2D services or expanding an existing service, in the UK? Which customer segments, devices and use cases would be served? Would your D2D service complement or compete with services delivered over existing mobile?

Q 3. JRC Response

Confidential? No.

No Comment

Q 4. If you have considered launching or expanding a D2D service in the UK:

What technology and network architecture do you consider appropriate to use to deliver D2D services? For example, what altitude and how many HAPS, LAPS or satellites would be required to deliver an initial service?

We're aware that different technologies and network architectures will have different costs, performance, and spectrum efficiency trade-offs.

Q 4. JRC Response

Confidential? No.

No Comment

Q 5. What capacity (e.g., Mbps/Km2/MHz) and quality of service (e.g., latency) could be delivered with the D2D service you are proposing? What percentage of the UK landmass could be covered, and would coverage be provided indoors?

Q 5. JRC Response

Confidential? No.

No Comment

Q 6. To inform our future policy development, which spectrum band would you like to deploy the service in? How much bandwidth would be required to provide the service at launch?

Q 6. JRC Response

Confidential? No.

No Comment

Q 7. What take-up profile do you assume in your planning? For example, the number of active devices, monthly calls made, and data transferred per device. What is the roadmap for enhancing your network to meet anticipated future growth? What additional infrastructure and/or spectrum would be required? When?

Q 7. JRC Response

No Comment

Q8 What are the use cases and the benefits these services would deliver? What technology, network infrastructure and frequencies would be required to deliver the service? What are the advantages of using this MSS spectrum compared to other bands?

Q 8. JRC Response

Confidential? No.

No Comment

Q9 What current, or future, technology developments will offer the opportunity for more efficient use of MSS spectrum? E.g., more spectrally efficient, or greater ability to share spectrum.

Q 9. JRC Response

Confidential? No.

No Comment

Q10. Could your existing, or proposed, service coexist with other users of the same frequencies within the MSS spectrum bands? If so, how is coexistence achieved? If not, please explain why sharing is not possible.

Q 10. JRC Response

Confidential? No

The Energy Network Operators depend on the operational integrity of a significant number of narrow band systems within the spectrum band 148-149 MHz for the operation and control of critical national infrastructure.

Previous sharing studies completed in 2002, of the 'detect and avoid' technology used by MSS satellite services in this spectrum has shown that it cannot reliably detect these incumbent terrestrial services operating in the same band due to the physical screening of devices from the satellite, and the inability of the satellite technology to differentiate between short data messages, non-radiocommunication interference and natural phenomena.

On this basis, the existing rejection of MSS services operating in the spectrum band used by Energy Network Operators for critical operational telecommunications, namely 148.0 – 149.0 MHz should be maintained as per the Radiocommunications Agency guidance in their letter of 20 June 2002.

In addition Energy Networks make significant use of the Maritime Mobile allocations managed by Ofcom in the 156.7625 – 156.7875 MHz, 156.8125 – 156.8375 MHz, 161.9625 – 161.9875 MHz and 162.0125-162.0375 MHz bands for critical national infrastructure communication and control. We encourage Ofcom to ensure appropriate compatibility studies have been undertaken to protect those incumbent users prior to further consideration of this spectrum for MSS services.

Q 11. Do you expect D2D services to be available prior to WRC-27? What services and benefits do you think an authorisation prior to WRC-27 might bring to UK consumers and businesses?

Q 11. JRC Response

Confidential? No.

No Comment

Q 12. Are there any mobile bands that should be prioritised for satellite based D2D?

Q 12. JRC Response

Confidential? No.

No Comment

Q 13: Are there existing systems that you consider could be subject to an increased risk of harmful interference from the introduction of satellite based D2D using mobile bands? If yes, are there specific mobile bands that you consider should be avoided to reduce this risk?

Q 13. JRC Response

Confidential? No.

No Comment

Q 14: Do you have any views on how spectrum for D2D services should be authorised? Does this vary by band, or type of NTN? Please explain the reasoning behind your preference.

Q 14. JRC Response

Confidential? No.

No Comment

Q 15: Are there any other points that you think would be useful in our considerations? In providing your response, please provide as much evidence as possible.

Q 15. JRC Response

Confidential? No.

We encourage Ofcom to consider how to manage and resolve the following potential issues associated with extra-territorial satellite systems operating into the UK;

- non-authorized handsets operating in the UK,
- the need for lawful interception of communications; and
- the (intentional or otherwise) interference to UK licensed and authorised radio systems by a satellite operator not subject to the UK regulatory regime.

Whilst there are ITU Regulatory processes in place to resolve issues between nations, these will not resolve matters within the short timescales necessary to ensure the operational integrity of critical national infrastructure and therefore Ofcom will need to establish the mechanism and authority to step-in and stop such outcomes swiftly.