JRC Response to the

Review of spectrum fees (Fixed links and Satellite Services)

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KEY POINTS

- JRC welcomes the opportunity to respond to this consultation.
- JRC advises that, whilst Ofcom has stated 'Demand from fixed links at 1.4 GHz is broadly static', demand for fixed links within the 1.4 GHz band is expected to increase as Smart Grid systems are rolled out.
- JRC notes that the proposed 1.4 GHz band fees, with the Minimum Path Length multiplier removed and the proposed Band Factor added, may be 4 x the current fees.
- JRC is concerned with Plum's opinion that, under its Opportunity Costs Estimates heading, 'We have applied this cap to the LCA values on the grounds that **the value of spectrum to mobile services in any band is likely to be significantly more than that for fixed services**'. This is an over-simplification in that not all spectrum below an arbitrary value of say 5 GHz will be re-assigned to mobile: it is hoped that this opinion will not lead to Ofcom automatically giving preference to requests from mobile services when deciding the long-term use of a band.
- In the case of the 1.4 GHz band JRC considers there is no justifiable reason for revaluing the band based on an alternative use for public mobile communications. If the band is harmonised for mobile broadband at the World Radio Conference 2015 (WRC15), its use will be changed to mobile, in which case pricing for continued use by the fixed service is irrelevant. If the band is not re-allocated to mobile broadband at WRC15 and the band therefore continues in its current use, its value should not be determined be reference to mobile broadband as that will not be valid comparison.
- JRC is concerned that Plum's analysis concentrates solely on economic values, discounting socio-economic value. Table 3-1 illustrates that the lower frequency bands are of greater importance from a socio-economic viewpoint than higher frequencies due to the predominance of public safety and utilities at the lower frequency end of the scale.
- JRC advises that there are communications requirements that cannot be met by public mobile systems. For example, Utility Operations require systems that are resilient to severe weather and loss of mains electricity supplies, and have very low end-to-end latency and minimal asymmetry.
- JRC reminds Ofcom that almost all goods and services supplied to the UK's citizens and consumers rely on the stable supply of electricity. Additionally, the successful control the electricity networks is reliant on the availability of suitable spectrum.

Consultation Questions – All and Satellite Respondents

Question 1 Do you agree with Plum's view of the potential higher value alternative mobile use of the 3.6-3.8 GHz bands over the next seven to ten years?

JRC agrees that any band that becomes harmonised for IMT use will become highly valuable to mobile operators.

Question 2 Do you agree with Plum's analysis of current and future demand for spectrum for fixed links? Please give your reasoning.

JRC advises that Utility Operations anticipate increasing its use of spectrum in order to meet its requirement to roll-out smart grid systems in pursuance of government energy policy objectives. It is expected that, whilst the current 1.4 GHz requirement may be relatively stable, a significant number of additional 1.4 GHz links may be required for power line protection as public operators reduce their commitment to provision of low latency, guaranteed routing and power resilience in their product portfolio.

JRC notes that the recent decision by Ofcom to remove access to the lower 6 MHz of the fixed links 1.4 GHz band, in favour of adjacent Supplementary DownLink (SDL) systems reduces the longer term capacity of the band by 25% as no new assignments can be made in the guard band, and where existing assignments are changed for any reasons, they will be re-allocated within the remaining 18 MHz only.

Question 3 Do you agree with Plum's analysis of current and future demand of spectrum for PES and TES? Please give your reasoning.

JRC suggests that, whilst the end-to-end latency may prove too long for some systems, the roll-out of Smart Grids may require access to satellite spectrum.

Question 4 Do you agree with the approach taken by Plum to calculate the opportunity cost of the spectrum? If not, how would you suggest the LCA is calculated? Do you also agree that this methodology is likely to provide a more conservative estimate?

Yes, capping the LCA values is likely to provide a more conservative estimate than the uncapped values.

JRC is concerned with Plum's opinion that 'We have applied this cap to the LCA values on the grounds that the value of spectrum to mobile services in any band is likely to be significantly more than that for fixed services'. Spectrum is only of greater value to mobile services when its use can be harmonised internationally and released in relatively large blocks. Conversely, where use of spectrum is not harmonised internationally, its value is greatly diminished. VHF Band III is a prime example of spectrum made available for mobile use in the UK but remained largely unused as it is not harmonised internationally. In the case of the spectrum in 1452-1492 MHz which has remained unused for a long period of time in the UK, it has only recently become of significant economic value once harmonised for SDL on a European basis.

JRC recommends that, inter alia, the socio-economic aspect should also be taken into consideration when predicting the value of spectrum.

Question 5 Do you agree that Plum has identified the correct options for its LCA analysis? If not, what option(s) do you suggest we consider for the Least Cost Alternative?

JRC has no comments.

Question 6 Do you agree with the cost assumptions that Plum has used in its analysis? Please provide documentary evidence if you disagree.

JRC advises that Plum is incorrect in its assumption that 'The option of more efficient technology (i.e. higher modulation) was also considered but because equipment costs do not vary by modulation i.e. the user will choose the most efficient modulation scheme available'. This is because Utility Operations systems are typically designed to deliver guaranteed availability, redundancy and resilience: higher data rates beyond a guaranteed minimum are not always required. This can result in a lower modulation scheme being used to enhance availability and reduce latency rather than a higher modulation scheme to increase data rate.

Question 7 Are there any other pieces of publicly available evidence we could use to estimate the opportunity cost of the use of 3.6-3.8 GHz for mobile use now?

JRC has no comments.

Question 8 Do you have any comments on Plum's suggestion to remove the path length factor?

JRC notes that the proposed fees with the Path Length Factors removed, and the proposed Band Factors added, may be (i.e. proposed value / current value):

- 1.35 to 3.60 GHz = 4.0 x current fee (4.0 / 1.0);
- 3.6 to 4.2 GHz = 3.0 x current fee (3.0 / 1.0);
- 5.0 to 10.0 GHz ~ 2.4 x current fee (1.8 / 0.74);
- 10.0 to 16.0 GHz ~ 1.4 x current fee (1.0 / 0.74);
- 16.0 to 20.0 GHz ~ 2.3 x current fee (0.7 / 0.3);
- 20.0 to 24.0 GHz ~ 1.3 x current fee (0.4 / 0.3);
- 24.0 to 40.0 GHz ~ 1.2 x current fee (0.3 / 0.26); and
- 40.0 to 57.0 GHz ~ 1.2 x current fee (0.2 / 0.17).

JRC would like Ofcom tol consider a location factor of 0.25 for 1.4 GHz links that are located in rural areas, e.g. where many Utility Operations links are likely to be operating.

Question 9 Do you have any comments on Plum's suggestion to add a location factor?

JRC agrees with up to 90% reduced fees in areas with low population, and / or in remote areas, because this is where many critical national infrastructure (CNI) links often need to operate.

Question 10 What are your views on the need to revise the bandwidth factor in the fixed link algorithm?

JRC notes that the current fixed links bandwidth factor[1] 'Minimum = **1 MHz** but any **actual value** above this with an observed maximum of 135 MHz'.

JRC suggests that, to encourage the use of low bandwidth systems, e.g. 2048 kbit/s in 500 kHz (and perhaps 64 kbit/s in 25 kHz for some Smart Grid links) as used by Utility Operations systems, the bandwidth modifier should be amended.

1 http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/guidance-for-licensees/FeeCalcDoc.pdf (Section 3)

Question 11 What are your views on the benefits of additional incentives for the use of high performance antennas? How might these best be implemented in our fees algorithm?

JRC suggests that, if introduced, any incentive should be sufficient to cover the additional cost of using high performance antennas over their operational period, including site rental costs.

It should also be observed that the use of larger antennas is not simply the cost of the antenna, or the additional space required on a tower to accommodate the larger antenna, but may have an impact on the wind loading on a structure. In addition, higher performance antennas will usually have a narrower beamwidth requiring more precise alignment and possibly a stiffer structure to support it, which may not be achievable on existing towers.

Question 12 What are your views on the suggestion that we further consider ways to incentivise the use of automatic power control, a suggestion we are minded not to take up?

JRC has no comments.

Question 13 What are your views on the proposed revisions to the PES algorithm and the TES ratio? In particular, do you agree we should use the relative denial areas to reflect the difference in opportunity cost between PES, TES and fixed links? Do you have any other suggestions for improvement?

JRC agrees with the proposal for a Location factor. Its inclusion could result in up to 90% reduced fees in areas with low population and / or in remote areas, i.e. where many critical national infrastructure (CNI) links often need to operate.

Question 14 Do you agree that the benefits of implementing geographic pricing are sufficiently high to warrant us considering this further? Should we look at both where mobile is, and is not, an alternative use? Do you have ideas on how this could be implemented?

JRC agrees with the proposal for a Location factor. Its inclusion could result in up to 90% reduced fees in areas with low population and / or in remote areas, i.e. where many critical national infrastructure (CNI) links often need to operate.

JRC highlights that Business Radio licences 50 km x 50 km squares to enable the licensee to install multiple radio stations within the square, typically, without the need to co-ordinate these with radio stations within the adjacent 50 km x 50 km squares. This is not the same use as what is being proposed for fixed links.

JRC therefore suggests that the fixed links squares should be 25 km x 25 km. This will enable a higher granularity when identifying which squares are considered higher value areas and which are in low population / remote areas, e.g. where mobile is not an alternative use.

Question 15 Do you have any comments to make on any issues related to next steps and implementation?

For regulated industries such as the utilities where price review periods may be up to seven years, it is important that any price increases in spectrum fees are introduced on a time scale commensurate with the regulatory review cycles in these industries.

Background

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 also represents gas and electricity interests to government on radio issues.

JRC and the utilities manage a significant number of fixed and satellite links to critical national infrastructure (CNI) and is keen for their protection and the on-going access to these bands.

JRC also 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.

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

JRC's Scanning Telemetry Service is used by radio-based System 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 works with the Energy Networks Association's Future Energy Networks Groups assessing the ICT implications of Smart Networks, Smart Grids and Smart Meters.