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29<sup>th</sup> November 2007

Dear Justin

**Re: Response to Ofcom Consultation; “Application of spectrum liberalisation and trading to the mobile sector”**

We have reviewed your consultation documents and appreciate in general terms the perceived benefits to the mobile sector, their customer base and the UK economy. We however note that the consultation restricts itself to analysis of the impact of the changes within the 900MHz and 1800MHz public mobile operator bands, with no apparent consideration of the impact upon neighbouring spectrum users. As such, Network Rail believes there is value to be added by addressing our concerns on boundary conditions in this letter, as well as responding to the consultation questions.

Network Rail are currently rolling-out, under a £1.5bn DfT sponsored initiative, a trackside fixed and mobile connectivity network to achieve compliance with mandatory European interoperability regulations. These require the deployment of GSM-R in the spectrum 921-925MHz paired with 876-880MHz; immediately adjacent to the 900MHz mobile spectrum covered by this consultation.

Looking back; Ofcom’s consultation “Spectrum Framework Review: Implementation Plan” of March 2005 touched on 900MHz “re-farming” and Network Rail’s response to Ofcom’s question 8.1: *“The GSM-R spectrum allocation is immediately adjacent to the 900MHz 2G allocation. As-such Network Rail have great concerns over any proposals to deploy non-GSM technology within this spectrum without prior independent assessment and testing to establish a clear framework of inter-operability rules”* does not appear to have resulted in any independent testing being reflected in the current consultation document.

After publication of ECC draft Report 96 "*Compatibility Between UMTS 900/1800 and Systems Operating in Adjacent Bands*" I wrote to Ofcom on 12th December 2006 tabling Network Rail's concerns over the potential deployment of UMTS at 900MHz (attached), the content of which I still believe to be valid.

Perhaps partly prompted by my letter, Ofcom attended a UIC special meeting on the 7th March 2007 in Mainz organised by European rail operators concerned about the potential impact of 900MHz UMTS on GSM-R system performance. The Finnish delegates shared with the meeting work that had been conducted by their consultant Omnitele; the conclusions of which could not fail to concern any operator of critical national infrastructure. For this reason it is surprising that Ofcom have issued a consultation document that apparently fails to give any consideration whatsoever of the proposed changes to spectrum neighbours, particularly GSM-R.

Moving to the technical proposals in the current consultation, it appears Ofcom are proposing to move from arrangements where a guard band appropriate to neighbour technologies (GSM & GSM-R) is mandated, to a situation where no protection arrangements are present when, for the reasons described previously, Ofcom are aware that interference problems have been identified.

Network Rail must stress in the strongest of terms that if the cell planning rules which under-pin the current GSM-R roll-out are compromised, this will have both cost and timescale implications. In order to gain Network Rail's support, Ofcom would need to demonstrate a set of technical rules for the future usage of the liberalised 900MHz spectrum based upon independent technical assessment of the impact of UMTS 900 and other technologies upon GSM-R.

If you require more detailed information or updates, I would be grateful in the first instance if you would contact my colleague Tim Lane on 07887 627147.

Yours sincerely

EUR ING S J Hailes MA CEng MIEE MIRSE  
Head of Telecoms Engineering

***Network Rail Response to Ofcom Consultation; “Application of spectrum liberalisation and trading to the mobile sector”- 29<sup>th</sup> November 2007***

*Question 1.1 Do you have any other comments on this consultation document in addition to those made in response to the questions set out below?*

*Network Rail Response: The consultation document restricts itself to analysis of the impact of the changes within the 900MHz and 1800MHz public mobile operator bands, with no apparent consideration of the impact upon neighbouring spectrum users, particularly GSM-R. Network Rail cannot support Ofcom’s proposals to move from arrangements where a guard band appropriate to neighbour technologies (GSM & GSM-R) is mandated, to a situation where no arrangements are in place to protect GSM-R from radio interference. This objection is based upon the modeling and practical experiences of other European rail operators, which indicate that GSM-R will sustain service affecting interference if appropriate technical rules of co-existence are not implemented by Ofcom. For more detail please see Network Rail’s letter of 12<sup>th</sup> December 2006 to Ofcom’s Paul Jarvis.*

*Question 3.1 Do you have any comments on Ofcom’s interpretation of its obligations under the forthcoming RSC Decision?*

*Network Rail Response: No comment.*

*Question 5.1 Do you agree that the 900 MHz spectrum is likely to provide a cost advantage over higher frequencies for the provision of mobile broadband services? If so, do you believe that Ofcom’s estimates of the size of that cost advantage are representative of what would realised in practice?*

*Network Rail Response: No comment.*

*Question 5.2 Do you agree that the 1800 MHz spectrum is unlikely in practice to provide a cost advantage over higher frequencies for the provision of mobile broadband services?*

*Network Rail Response: No comment.*

*Question 6.1 Do you agree that if the existing distribution of the 900 MHz spectrum continued post liberalisation, this would be unlikely to promote competition for the provision of mobile broadband services?*

*Network Rail Response: No comment.*

*Question 6.2 Do you agree that if the existing distribution of the 900 MHz spectrum continued post liberalisation, this would be unlikely to secure optimal use of the radio spectrum?*

Network Rail Response: *No comment.*

*Question 6.3 Do you agree that if the existing distribution of the 1800 MHz spectrum continued post liberalisation, this would be likely to promote competition for the provision of mobile broadband services?*

Network Rail Response: *No comment.*

*Question 6.4 Do you agree that if the existing distribution of the 1800 MHz spectrum continued post liberalisation, this would be likely to secure optimal use of the radio spectrum?*

Network Rail Response: *No comment.*

*Question 8.1 Do you agree with Ofcom's assessment of the merits of Option A (Liberalisation in the hands of the incumbents) for the implementation of the RSC Decision in respect of the 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 8.2 Do you agree with Ofcom's assessment of the merits of Option A (Liberalisation in the hands of the incumbents) for the implementation of the RSC Decision in respect of the 1800 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 9.1 Do you agree with Ofcom's assessment of the merits of Option B (Liberalisation in the hands of the incumbents subject to a roaming condition) for the implementation of the RSC Decision in respect of the 900MHz spectrum?*

Network Rail Response: *No comment.*

*Question 9.2 Do you agree with Ofcom's assessment of the merits of Option B (Liberalisation in the hands of the incumbents subject to a roaming condition) for the implementation of the RSC Decision in respect of the 1800 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 10.1 Do you agree that in principle some form of mandatory release of 900 MHz spectrum is appropriate in order to implement the RSC Decision?*

Network Rail Response: *No comment.*

*Question 10.2 Do you agree that in principle some form of mandatory release of 1800 MHz spectrum is unlikely to be appropriate and that Option A is likely to be the most appropriate means to implement the RSC Decision in respect of the 1800 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 11.1 Do you agree with Ofcom's assessment that the version of Option C in which there is the simultaneous release of three 2 x 5 MHz blocks of 900 MHz spectrum in 2010 is likely to be the most appropriate means to implement the RSC Decision in respect of the 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 12.1 Do you agree with Ofcom's proposal for the mechanism of release and the terms and condition for the released 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 12.2 Do you agree with Ofcom's proposal for the terms and conditions for the retained 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 13.1 Do you agree with Ofcom's assessment of the merits of Option D (Full Mandatory spectrum Release) for the implementation of the RSC Decision in respect of the 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 14.1 Do you agree with Ofcom's proposals for the implementation of the RSC Decision in relation to the 900 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 14.2 Do you agree with Ofcom's proposals for the implementation of the RSC Decision in relation to the 1800 MHz spectrum?*

Network Rail Response: *No comment.*

*Question 15.1 Do you think that Ofcom should make the 900 and 1800 MHz spectrum available for systems other than GSM and UMTS? If so, for what systems, on what timescale and by what mechanism?*

Network Rail Response: *In order to gain Network Rail's support, Ofcom would need to demonstrate a set of technical rules for the future usage of the liberalised*



*900MHz spectrum based upon independent technical assessment of the impact of those systems upon GSM-R.*

*Question 15.2: Do you believe that licences for the 900 and 1800 MHz spectrum should be made tradable? If so, on what timescale and should trading be subject to any competition restrictions ?*

*Network Rail Response: Subject to the liberalised 900MHz spectrum being covered by a set of technical rules based upon independent technical assessment of usage upon GSM-R..*

*Question 16.1 Do you believe that the licences for 2.1 GHz should be liberalised and if so on what timescale?*

*Network Rail Response: No comment.*

*Question 16.2 Do you believe that the licences for 2.1 GHz should be made tradable and if so on what timescale?*

*Network Rail Response: No comment.*

**END**



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Paul Jarvis  
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12<sup>th</sup> December 2006

Dear Paul

**Re: Draft ECC Report 96 on compatibility between UMTS 900/1800 and systems operating in adjacent bands**

I believe Ofcom will have been in receipt of the above report which is likely to have been of interest in respect of the options for 2G spectrum re-farming discussed in Ofcom's Spectrum Framework Review Implementation Plan consultation document. As a member of the European railway community Network Rail must act to secure the interests of the railway organisations operating in the GSM-R band according to mandatory interoperability requirements described in Technical Specifications for Interoperability (TSIs) for High Speed Lines and Conventional Railways.

With respect to these specifications, we must take the safety-relevant railway applications and the importance of high quality of service into account. To keep up the targeted high standard of the GSM-R network, we cannot accept the ECC report 96.

The specific requirements of the railways, raised by UIC and ETSI TC-RT are not taken into account, such as for example:

- Railway emergency calls must be established within 2 seconds with a performance of almost 100 per cent
- Continuous data transmission by the European Train Control System (ETCS), which allows only one call drop per 100 hours (including handover failure as well as radio interference)

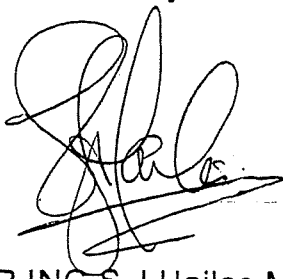
In Ofcom's review of the draft report, and in any response you make to ECC, we would request that you take into account the following, suggesting that ECC should give serious consideration to revising the study:

1. One per cent outage might be relevant for UMTS but it is far too high for the GSM-R standard (this was acknowledged in Ofcom's recent GSM-R/MOD interoperability study)
2. The correlation of outage and dropped calls is not defined.
3. Why are different values of 1% outage for speech calls and 0.5% outage for data calls defined?
4. What is the distribution of this 1% and 0.5% outage related to time, cells, areas and traffic load?
5. Please note that the rate of dropped calls and outages, including their distribution has to be defined by the railways following their specific needs.
6. The interference of a UMTS channel to GSM-R is greater than the interference of a GSM channel to GSM-R. One single UMTS channel could simultaneously interfere with all GSM-R channels.
7. A distance of at least 4330 metres between railway lines and a UMTS location (according to the simulation) is necessary and has to be stipulated in the specification as well as in the UMTS conditions.
8. According to Fig. 3-8, the distance between UMTS base stations is approximately 8 km. This may be realistic for rural areas but the distance will be much shorter in urban terrain.
9. The influence of UMTS interference in the surroundings of railway crossings, large stations, hubs, shunting yards and high-density railway areas has not been considered properly.

Summarising the facts mentioned above, it is obvious that only a small part of the negative impact of UMTS 900 on the GSM-R band is taken into account. Considering all these facts, it is obvious that a proper analysis has to be performed and the report has to be updated following the results of the analysis.

The railway community is prepared to support the work on upgrading the model to make it useable for this specific subject and to help to find an acceptable common solution.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J Hailes', with a horizontal line drawn through the bottom of the signature.

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Head of Telecoms Engineering