Intellect Response to Ofcom's Consultation on Spectrum Commons Classes for Licence Exemption, due date 15th July 2008:

Q1: Do you agree that the spectrum commons class of a technology should be based on its interference characteristics?

Intellect: Yes.

Q2: Do you think that the ratio of channel bandwidth to the width of the band is a good representation of the use of the frequency domain resource and the interference potential of a technology in this domain?

Intellect: Yes.

Q3: Do you think that the duty cycle is a good representation of the use of the time domain resource and the interference potential of a technology in this domain? Do you agree that the duty cycle should be evaluated at the busy hour?

Intellect: The Duty cycle factor should also be integrated across all the local SRDs/Short Range Devices that may form a subsystem. Take for example a building sensor/security network where individual nodes may be only at 0.1% use but a few dozen sensors still add up in the local vicinity...

Q4: Do you think that the interference coverage plus the density of transmitters give a good representation of the use of the space resource and the interference potential of a technology in this domain?

Intellect: Yes

Q5: Do you agree with our method to calculate the interference coverage area of a transmitter? What is your view on a threshold level of -80 dBm/MHz to determine the interference range? Do you think the threshold level should be expressed as power density (dBm/MHz) or as power (dBm)?

Intellect: We would first wish to make the point that this question is too complex for a simple answer on paper to suffice. We believe there are a lot of details to be resolved. As an interim step however, Intellect would make the following comments.

We believe that the –80dBM/MHz number may not be well justified. It is very difficult to reach a level without making very rigid technology assumptions. Whether –80 is right depends on the prevailing conditions in the band. At a high frequency it might be allright, but at low frequencies it isn't. It is far too much bandwidth. We suggest –80 in 100kHz as a better number, but please also note the following.

The interference power density at the receiver of -80dBm/MHz is equal to a receiver noise figure of 34dB or a reduction in range to 1/50 of that attainable in a noise free / interference free system. This may be too high a level to accept for the envisaged future systems. Although this figure may be representative of existing systems, improvements in performance may result in a higher sensitivity and require a lower interference level to take advantages of the increased

performance. A figure of -100dBm/MHz at the receiver may represent a better compromise. The definition however, may not be "technology neutral" since the capture area of the receive antenna is not accounted for in the definition. To accommodate the antennas, the definition must relate to a defined capture area e.g. -100dBm/MHz/cm^2 or -60dBW/MHz/m^2.

By defining the interference levels in dB/MHz/m^2, those with systems with a larger capture area will therefore receive a higher noise at the receiver input but will be protected at the same level of performance at the receiver input.

We are furthermore concerned as to how the Density of devices will accurately be predicted for future devices in new bands. Also, how will the license-exemption regulations be able to clearly identify which devices are allowed in a given band and which are not (for example how will "politeness" be quantified?).

Q6: Do you agree with using a busy yet realistic scenario to derive the transmitter density of a technology?

Intellect: Yes

Q7: Do you agree with the Interference Indicator being a product of the frequency domain factor, the time domain factor, the interference coverage area and the transmitter density?

Intellect: Yes

Q8: Do you think that three classes of spectrum commons is the right number? What is your view on the proposed boundary values for the three classes?

Intellect: We think that dividing the medium class into two classes should be considered. It is a factor of 100 that differs the low from the high boundary. Another approach can be to keep three classes but increase the lower boundary.

Q9: Do you agree with our definition of fairness and that all systems should be required to behave in a fair manner?

Intellect: Yes.

Q10: What is your opinion on the effectiveness of blind detection sensing techniques compared to signal specific techniques?

Intellect: We believe that blind detection sensing techniques will be sufficient. We also see that blind detection will be improved with more processing power in the receivers together with improved algorithms.

Q11: Do you agree with the proposed polite rules?

Intellect: Yes.

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