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**Additional Response to Ofcom's Digital Dividend Review: 550-630 MHz and 790-854 MHz, Consultation on detailed award design, 6 June 2008**

Dear Sir

I wish to respond to *Question 19: We welcome views on the merits of the proposed approach to information provision; in particular concerning the type of information that may be helpful and any impacts that publication of information might have both on licence holders and the wider spectrum market.*

Professor Martin Cave's "Review of Radio Spectrum Management: An independent review for Department of Trade and Industry and HM Treasury" of March 2002 recommended "*shifting the balance of the responsibilities for interference management further towards operators*" using "*three important prerequisites*" of (1) a central public device database; (2) interference benchmarks; and (3) enforcement arrangements. Professor Cave advised "*The introduction of public on-line frequency assignment/technical information*" would change the existing requirement for only "*systems with similar characteristics..to share frequencies*" and thus "*facilitate the review's proposals for a flexible and market-led spectrum management environment*". Professor Cave was correct.

**A central public database of device details is essential to securing optimal use of the spectrum.**

The likelihood of non-linear interference increases according to the number, location and characteristics of nearby transmitters or 'transmitter density', for example, the increase in likelihood of receiver intermodulation interference is exponential. Absence of a central public device database and the inability for licensees to know exactly where a device is located and its basic operating characteristics, has meant that Ofcom has been left with no other option for management of the many forms of non-linear interference but through use of an overly-simplistic and thus spectrum inefficient, broad-brush, one-size-fits-all design utilising very rough estimates of 'transmitter density', involving

notional test points within notional test areas at notional heights<sup>1</sup>. Such a design is much too inefficient for managing non-linear interference mechanisms.

Australia's space-centric management, which establishes primary interference benchmarks as power radiated at an antenna (or antenna spectrum masks), informs neighbouring licensees of the exact level of non-linear interference via those benchmarks together with a centralised public device database. In spite of Ofcom's protestations, Ofcom's design can not possibly directly control the interference levels experienced by neighbours because notional data is used for compliance verification and therefore, unlike space-centric management, neighbouring licensees do not have access to the necessary detailed device information to accurately estimate the interference levels they can expect from the transmissions concerned. Transmit rights together with a centralised public device database allow neighbouring licensees to accurately estimate the levels of both linear and non-linear interference they can expect.

Irrespective of whether primary spectrum usage rights are transmit (PSD) or receive (PFD), spectrum usage rights in general can not function efficiently without a central public device database. Furthermore, once a database has been implemented, it is simple to demonstrate that transmit rights (PSD) provide the most efficient method by which to confer rights capable of achieving optimal spectrum use. Even Ofcom's current proposal foresees the necessary role device details must play. For example, Ofcom intends to decide such things as non-compliance of devices using data obtained from "mast rental contracts" and the "investigated licensees". In addition, Ofcom requires "codes of practice" to be negotiated between licensees after an auction for identifying the type of device information that needs to be communicated directly between licensees and the arrangements for its exchange. These proposals by Ofcom not only point to the necessity of a central database of device details, they also highlight serious flaws in the Ofcom proposals, flaws which, by entrenching managerial inefficiencies, create unnecessary costs for UK industry and ultimately the consumer.

Despite Professor Webb asserting "new entrants tend to be happier with SURs because they don't have a tradition of working with the earlier licensees", the partial solution presented by SURs forces all licensees to work very closely with each other which generates levels of inefficiency not found in more evolved systems. Even Ofcom realises this: "Ofcom will not be placing a formal coordination obligation on licensees in this respect, rather it is expected that licensees will cooperate voluntarily".

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<sup>1</sup> A typical size for a test point can be 50m by 50m. In any test area, there may be hundreds or thousands of test points. The test area is an area covering at least 10 transmitters. Its size is determined based on how large it needs to be in any given location in order to enclose at least 10 transmitters. Generally, it can be expected to cover many square kilometres!

Throughout the years since Professor Martin Cave's report it has become more and more inevitable from Ofcom's ensuing policy decisions concerning information availability about devices in support of market liberalisation, that if Ofcom do not regulate for a central public device database, the market is likely to eventually become dysfunctional.

I sometimes wonder why Ofcom steers so resolutely away from implementing a central public device database. It is possible that in refusing to come to terms with the inevitable, Ofcom might be reacting to the difficulties and perhaps trauma it has experienced with operating its Sitefinder web application? Ofcom's Wireless Telegraphy (Register) (Amendment) Regulations 2008 did *"not provide precise details about individual transmitters due to security concerns"*. The 'security concerns' were apparently a reaction to EMR/EMF mast activists. Given the natural visual impact of masts as well as the general availability of RF scanners, a central device database provides little additional assistance to mast activists and 'security concerns' are not well founded. In any polity genuine security concerns exist, these should be dealt with sensibly within the spectrum management regulatory regime, not used as an excuse for stifling innovation.

Eleven years experience in Australia has demonstrated that spectrum licensees are very happy with the requirement for a centralised device database and not only because of the legal and technical transparency that it creates in relation to the management of non-linear interference. A centralised database of certified device data is an essential tool for defining clear property rights and the self-management of interference generally, as well as being an essential input for licensees to independently establish the real utility/value of a spectrum licence for an auction and subsequent trading. Once database elements and an online central register are established by the regulator, industry is able to proceed to automate its coordination and compliance verification processes, which is a significant saving for industry. Given its key function in so many spectrum management activities including interference investigation and audit, provision of a central online device database can never be a disproportionate burden on either the regulator or industry. It is generally accepted that enabling the necessary information flow is central to a correctly functioning market.

A central public device database provides a harmonised level playing field for all licensees, whether new entrants or established operators. It makes interference self-management practical and accurate and thus secures optimal use of the spectrum. It provides legal transparency, primarily for the avoidance of interference disputes altogether, but if necessary for interference settlement.

A central public device database:

- allows all device details to be readily available to all licensees in a standard format rather than requiring licensees to obtain possibly unreliable and partial information through one-on-one negotiation via a multiplicity of proprietary data formats;
- establishes a concise harmonised set of parameters for transmitters and receivers consistent with operation of the spectrum licence conditions and the needs of all licensees;
- provides the basis of a framework for the efficient management of non-linear out-of-band interference ('transmitter density'), including a transparent first-in-time status for each device, rather than an inefficient process involving notional parameters and 'mast rental contracts';
- allows industry to easily automate its coordination processes, assisting licensees in making accurate assessments of necessary receiver protection in relation to all interference mechanisms;
- is a point of reference for the settlement of interference disputes for both licensees and the regulator including interference to incumbent legacy services;
- records whether all affected licensees have indeed agreed to a spectrum sharing agreement or change of use;
- supports enforcement through desk audits of licence compliance by the regulator;
- facilitates open and transparent assessments of spectrum utility/value before an auction or subsequent trading.

Owing to the interdependent nature of interference, establishing a system of property-like rights for flexible spectrum access requires at its centre, a central public device database.

The spectrum space asset can only be delineated from a matrix of devices by accurately controlling the interference levels resulting from all interference mechanisms at the frequency and geographic (and time) boundaries of the spectrum space.

Interference levels may be controlled at either the transmit (PSD) or receive (PFD) end of the communication link, however, while there are good practical reasons for preferring PSD, both require a central public device database to secure optimal use of the spectrum.

Is it possible for this issue to receive the attention it deserves?

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