futurepace
RF Solutions

DDR Cleared Award Project Team
Spectrum Policy Group, Ofcom
3rd Floor
Riverside House
2A Southwark Bridge Road
London SE1 9HA

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 8: Do you agree with the use of SURs as the approach for defining consistent TLCs for this award?*

The use of SURs, that is, specifying in a licence "*the interference a licensee is allowed to cause, rather than the signal it is allowed to transmit"* as the basic Technical Licence Conditions (TLCs) for the introduction of new services, would, in the case of multiple spectrum-adjacent licensees, create an unwieldy and unmanageable regulatory framework.

In spite of Ofcom's affirmation, that "*most supported our proposals*" the majority of your previous SURs consultation responses from UK industry actually state the opposite. SURs are unsuitable for use as licence conditions.

All the difficulties associated with using SURs or aggregate PFDs as primary spectrum usage 'rights', and there are many, are clearly set out in my paper "Commercial Certainty in Spectrum Right Formulation" available at www.futurepace.com.au

As far as I am able to gather from Ofcom publications, the key argument for Ofcom's continuing desire to use SURs is that transmit masks "*do not account for transmitter density*"[1] .

That key argument is an unnecessarily narrow view of the options actually available to Ofcom.

[1] See Digital Dividend Review: 550-630 MHz and 790-854 MHz, Consultation on detailed award design, 6 June 2008 "*5.3 However, transmit masks do not directly control the interference levels experienced by neighbours, as they do not account for transmitter density. The more transmitters of a given power that there are in a given area, the higher the risks of neighbours experiencing significant interference from them. Hence, with this form of TLC, neighbouring licensees will have less information on the interference levels that they can expect from the transmissions concerned*"

While Ofcom is to establish a central database of general licence information, the inclusion of detailed information about transmitters and receivers (devices) is viewed as being unnecessary. 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.

Lack of a central public device database and the options it offers for more accurate and efficient interference management is the main reason Ofcom has persisted with SURs in spite of overwhelming industry opposition.

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 is left with no other option for management of the many forms of non-linear interference but through use of an overly-simplistic and thus 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[2].

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 the centralised public device database it incorporates. 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 estimate the interference levels they can expect from the transmissions concerned.

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. Martin advised "*The*

[2] 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.

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*". Martin was correct.

Eleven years experience in Australia has shown 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 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.

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 lack of a central public device database will result in a dysfunctional market.

Forgetting the lack of necessary device data for the moment, there nevertheless remains a better solution than SURs that is still available to Ofcom: specify either a variable, or a stepped set of spectrum masks, with characteristics derived from a range of transmitter densities.

Such a solution would provide an end technical result for licensees much clearer and simpler than SURs with very little, if any decrease in practical spectrum utility, but more importantly, without the current high levels of uncertainty and licence management costs.

I understand that, given the delays already experienced with your spectrum auctions, Ofcom might now prefer to adopt a blinkered approach to the design of its TLCs and press on regardless with SURs, but it would obviously be possible to quickly reverse-engineer the necessary spectrum masks from your proposed aggregate PFDs and propagation models, thus removing much unnecessary detail and confusion from the licences.

It is unclear to me why Ofcom has hung on so tightly to the concept of SURs especially when it has been demonstrated repeatedly by numerous independent commentators to be flawed and now in the final analysis, to be not actually required.

Confusion in the general debate could be generated by certain parts of UK industry being quite enthusiastic about the current Ofcom proposal because they can see a potential money-spinner, given the services they could offer for the high levels of negotiation that would be required for general use as well as change of use.

I am not swayed by the rumour that Ofcom may wish to "save face" by not doing an "about face" on SURs.

Clearly Ofcom will be swayed only by policy and technical excellence, industry imperatives and the interests of the UK public. Ofcom's current proposal is certainly a "licence to print money". Exceptions to the money printing club at present seem to be the spectrum licensee and the UK public who inevitably bear the cost of Ofcom policies.

Michael Whittaker
Futurepace RF Solutions, Australia
8 June 2008