

Ofcom Consultation on 'Spectrum Usage Rights'

Intellect Initial Response dated 19th June 2006

Intellect position statement

Intellect welcomes this opportunity to respond to the Ofcom consultation on Spectrum Usage Rights.

We note that Ofcom's Spectrum Vision, set out in the Spectrum Framework Review forms the basis for Ofcom's spectrum management strategy. We note not only that Ofcom is beginning to implement that policy but that many of the issues that are addressed in this consultation will arise as a consequence of this policy.

Intellect has concentrated in its response on the technical issues that may arise as a result of these proposals. Many of these concepts of managing interference between services while not new to the radio industry will require careful consideration if problems are to be avoided with the advent of spectrum trading and increasing use of the spectrum. Intellect is not opposed to the principle of spectrum usage rights but is very concerned to see successful implementation. We strongly suggest that SURs are rolled out in a controlled manner perhaps initially in a limited set of bands, so that the scale of any problems which may occur will be sufficiently limited to allow the problems to be addressed effectively to avoid possible difficulties, and that there should be a mechanism in place to revise the methods in the light of the experience gained.

There is a major concern we have identified in the costs of implementing a system such as this and some concern that the proposals are overly complex and a simpler solution for some of the interference modes could be used (e.g. emission masks) For an SME who holds a licence they may neither have the technical skills to carry out these assessments nor be able to afford to pay for expensive expertise to negotiate with a large company with extensive skills and funds. Furthermore where a user in the past was able to rely on the regulator to carry out much of the interference assessment work the impression gained from this consultation is that Ofcom intends to leave much of the work to the users some of whom do not possess the necessary skills. With the advent of higher computer power and the establishment of new interference modelling tools there must be sufficient money made available for all users to avail themselves of these free of charge. Although modelling is no substitute for practical measuring they are useful for first cut evaluations. These tools must be based on sound engineering practice, making use of the best available information, and all parties must be able to agree that they are suitable. There must be a dispute mechanism established to ensure that both parties can get a swift resolution to their problem. Ofcom must not abrogate its responsibilities to manage the spectrum efficiently under the terms of the Communications Act 2003.

Questions and Answers to Ofcom's Spectrum Usage Rights Consultation

Question 1: What is the best way to control in-band interference across geographical boundaries?

As a **purely administrative device**, the use of *aggregate power flux density* (PFD - dBW/m²/reference bandwidth) criteria at any point at or beyond a defined boundary may be appropriate. However, whether such criterion will prevent harmful interference to a victim will depend on the level set and the antenna gain assumed for the receiver. Care is needed to ensure that the "administrative" reference level determined does not over estimate the protection required.

We do not agree with paragraph 4.25.3 which suggests only defining a PFD at the geographical boundary. There are instances where the spectrum mask is a more accurate way of assessing the total interference. In addition there needs to be a recognition of the EMC interference mechanisms as the emissions from general equipment will play an important role in determining the environmental noise floor seen by the receiver. In addition, consideration needs to be given to the right of a transmitter to radiate sufficient power to perform its function. If subsequently interference to general equipment occurs and the transmitter is working correctly and in specification, then the immunity of the victim needs to be addressed, rather than requiring the transmitter to reduce power. There may be scope to address antenna location to reduce field strength at the victim, however, EMC standards do not guarantee immunity in the environment.

It will be important to be clear about the percentage time that interference can exceed a given value and whether this is for example an annual or worst month figure (they are very different).

Question 2: What is the best way to control interference caused by out-of-band emissions?

We agree with the conclusion in 4.37.2 that no one method covers all eventualities. The probabilistic approach would disadvantage victims who happen to be normally located at 'poor' locations, so we do not see how it could replace masks.

Question 3: What is the best way to control interference caused by in-band emissions

Again the mechanisms are the same as question 2 with different values. Therefore we do not see the probabilistic approach replacing power levels. There is an issue concerning the notion of improving receiver selectivity. The industry has never been licensed on receiver selectivity as systems are usually specified with an adequate margin for interference rejection. If however there is an increase in in-band interference some but not necessarily all receivers could be adversely affected. Resolving the problem could be very time consuming. Care should be taken that the power levels are as specified. New systems with higher margins will be less problematical where best practice in receiver design can be employed. Emissions from general equipment will create "in-band" interference at some level or other - dependant on proximity to the receive antenna. Power levels defined should take account of this fact and not place over-tight emission limits.

We do not agree that the arbitrary performance of the victim's receivers must dictate what the interferer does in his own spectrum in his own service area. Rather, minimum receiver performance should be expected and if receiver performance is poorer than what is deemed to be reasonable then the victim must put up with the degraded performance.

Question 4: Which would be your preferred option for control of spurious emissions? If not one of the above, what would you prefer?

Both out of band and spurious emissions are defined in the relevant standards as unwanted emissions. For example CEPT ECC Rec 74-01 and the equivalent ITU Recommended values are widely used. The second bullet in 4.46 is the preferred option where the new user is responsible for rectification of the problem, unless it can be shown that the first unit is not compliant in some respect. Spurious emission from associated, non-radio, equipment will be governed by the applicable EMC standards.

Question 5: Do you agree to the proposed approach described here for Indicative Interference Levels?

We believe that existing users have a legitimate expectation that the level of interference currently planned for in system designs will not be exceeded following introduction of SURs. The Ofcom Frequency Assignment Criteria often limit interference at the input of the receiver (i.e. after the antenna) to a certain level. This issue is crucial for certain services such as international Earth stations. We support Para 4.51 and have concerns with 4.48 (i.e. it places unacceptable onus and costs on the victims and Ofcom should take the responsibility for protecting licensed users from interference). In general, Ofcom should take into account the general EMC emission limits, the rate of technology growth in commercial and domestic sectors when providing IIL's.

Question 6: How should a licence holder determine which frequency and geographical neighbours should be involved in a change of use negotiation?

In 5.10 the second box the licensee should seek advice from Ofcom or, where the bands are controlled by a band manager, then advice should be sought from the band manager. It is unreasonable for the licensee to be aware of all of the adjacent users. SME's may need low-cost expert assistance in negotiating with adjacent users.

Question 7: Would it be useful for Ofcom to make its change of use modelling tool publicly available?

All modelling tools used in connection with spectrum usage rights should be made freely available to all parties. They should define the propagation tools used, the databases employed and have been tested as fit for purpose. All licenses for using these tools should have already been granted for the sole purpose of checking interference levels. If these tools are made available on-line, then it may be possible to incorporate the use of privileged information in the model without disclosure to the user

Question 8: Are the proposals for negotiating a change of use with non-commercial and other similar users appropriate?

Yes. Intellect supports increased resources being applied for both Government and non Government users to determine the practicability of change of use. We look forward to Ofcom's proposals on the subject.

In the case of RSA, (5.22/23) Intellect awaits Ofcom's more detailed proposals.

We note the reference in 5.38 and remind Ofcom that it has international obligations in respect of international coordination. Many foreign administrations would be unlikely to negotiate with individual licensees and Ofcom will have to front these discussions

Question 9: What is the best approach towards enforcement and dispute resolution?

Ofcom should use its existing powers. These must not be delegated to third parties. Ofcom should intercede when bilateral discussion fail. It is particularly important in the case of large users with massive resources negotiating with small users who do not have the skills or wherewithal to negotiate their position. Anti-competitive situations could easily arise. There may be a case for a simple arbitration board or panel being set up before Ofcom need to become involved. Ofcom should bear any additional costs.

Question 10: What is the right approach to setting initial licence parameters for an SUR.

Intellect believes the user must decide by defining values for the relevant criteria defined by Ofcom. A spectrum mask may also be relevant. The examples in 6.9 are difficult to define and probably give a spurious degree of accuracy.

Question 11: What is the best approach to the measurement of interference?

Intellect supports the concepts of measurement rather than propagation models where possible. We support commonly agreed methods of measurement and to minimise costs an automated process where possible. It is assumed that the measurements would be funded by the new user. The new user may be an SME or innovator and the cost of extensive measurement prohibitive. All potential users should have equal rights to available spectrum within the cost framework applied to that spectrum. Initial users may have need for little or no measurements to be made, subsequent users may then suffer the costs of making measurements in a complex, populated spectrum. Ofcom should provide the costs for the measurement through suitable contract services.

This needs to be defined on a case-by-case basis, including automated measurements in some instances. The suggested minimum 300 second measurement period is far too small a time interval to check PFD levels for any specified time percentage, particularly for short-term criteria, whether it is for an average year or worst month.

It is not clear how measurements at the proposed height of 1.5 metres above ground level (section 6.13) are meant to assess whether PFD specified limits at 30 metres above ground level (as proposed in section 6.9) have been exceeded. The effects of ground clutter around the point of measurement could have a significant impact on the measured

level. The measurement antenna characteristics need to be accurately known, in order to convert measured signal level to power flux density.

Question 12: Should SURs be initially introduced at national and wide-area level

SURs should not be imposed but should be voluntary initially.

The introduction of SURs must clearly be carefully phased over as short a time period as possible, but not in a manner which would give unfair competitive advantage to certain players.

Further the introduction of SURs should not override the application of the EU's R&TTE directive. Specifically any product that meets the essential requirements linked to the R&TTE directive for the relevant spectrum band should be allowed to be sold and deployed for that band throughout the EU including in the UK.

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