

General Comments.

1. The reform will establish a single, unified, regulatory body (OFCOM) that is intended to be responsive to the needs of the communications and media industry and deliver effective spectrum management to the long term benefit of the UK economy. It will also address the requirements of defence, transport and emergency services.

It is not clear how or whether OFCOM is charged with making necessary provision for experimentation, test and development, upon which future radio technology rests.

Research and Development costs must be recouped in the appropriate time-scale, possibly only a few months for short-life product to a couple or three years. Access to the spectrum for test and development (via Test and Development (T&D) licenses) does not immediately provide income to the manufacturer and the costs involved must be amortised in the necessary time-scale. Controlled access to "high priced" spectrum will be required but at a cost that must not stifle innovation.

2. Logic dictates that research and development, where possible, should be carried out under conditions of suppressed radiation, e.g. within "screened enclosures". This reduces the effective radiated power and, therefore, the interference range by a considerable degree. However, the purchase and maintenance cost of a screened enclosure, that emulates free space propagation conditions, is relatively high thus perpetuates the need for free-space radiation.

Free-space radiation for test and development when suppressed radiation is possible can be considered inefficient use of spectrum, while high spectrum pricing for this use may be seen as anti-innovation.

To resolve this conflict, companies (particularly SME's) could be encouraged to make the investment in equipment that will suppress radiation - possibly by some form of grant scheme.

Access to T&D licenses will still be required in order to carry out those tests that cannot be conducted in a screened room, though these will be fewer in number.

3. With increasing use of radio-based technologies, there is an increasing risk of intolerable interference being caused to electronic circuits. While there is an increase in risk, for most electronic equipment it is mitigated by the requirements of the EMC directives.

However, where electronic equipment is used with EMC protection reduced, removed or not yet introduced (e.g. under test, development, research, and calibration) there is potential for received interference to affect the item. Where this risk is significant, the circumstances may warrant mitigating measures.

Options for mitigating measures will include moving the transmitter, moving the sensitive electronics away from the transmitter or using screened rooms to isolate the electromagnetic environment inside the room from that outside the room. This latter option may be the only viable option as it is the only measure that can provide positive interference protection of electronics from radio transmissions.

Arrangements for making grants available for the purchase of screened rooms would reduce the financial difficulty of coping with "environmental" impact especially for SME's.

4. Such arrangements may be seen to benefit industry and assist OFCOM in managing the spectrum by;
 - encouraging the use of suppressed radiation for test and development
 - reducing the occurrence of non-licensed, free radiation, test and development
 - assisting the reduction of unresolved cases of interference to licensed users

- reducing electromagnetic environmental pollution
- giving support to the electronics industry assisting them to protect the spectrum
- Protect the electronics industry from the environmental impact of significantly greater spectrum utilisation.

5. It is noted in the responses that there is some concern regarding spectrum pollution (unintentional electromagnetic emissions) from e.g. xDSL technology, limiting deployment of radio based systems. If interference is caused to HF (or short-wave) radio reception it may be a safety-of-life issue.

HF radio communications has played a part in numerous sea rescues, international requests for help as well as providing early communications regarding the 'incidents' such as the Falklands and Yugoslavia incidents. Such communication does not necessarily take place at strong signal levels, but more often may be only a small margin (a few dB's) above the noise floor. Interference tends to degrade the noise floor of HF receivers more than, say VHF receivers.

Protection of all radio-communications spectrum from interference is currently an aspect of the Radiocommunications Agency / DTI remit and should continue under OFCOM. Care should be taken to ensure that the rapid growth in all forms of communication technology does not bring unmitigated problems to any portion of the international community.

Specific Comment to discussion points.

6. *ix. What scope is there for greater autonomy in domestic spectrum policy within the constraints imposed by the UK's national commitments?*

Domestic policy is constrained by the Radio Regulations and the degree of commitment of HMG to maintaining ITU (part of the United Nations) agreements.

Technically, interference to European Neighbours may (and does) occur for a number of days each year - certainly in the low and middle portions of the UHF spectrum and below (e.g. below, say, 2GHz). Unilaterally changing the spectrum use could exasperate that interference if less compatible radio systems are forced to co-reside.

Other constraints will be (are) imposed by the need for stability (for long term planning and prevention of unnecessary equipment obsolescence) and compatibility of equipment on a European / World-wide scale and common spectrum use - such as air and marine bands.

7. *xiii. To what extent would greater transparency of specific data on current and prospective spectrum uses support efficient spectrum use? What are the key issues and trade-offs pertinent to the provision, by RA, of an on-line database containing spectrum utilisation details? How far is transparency compatible with commercial confidentiality and public safety and security considerations?*

Greater visibility of spectrum usage would help with forward planning of T&D licence applications. If facilities were included to provide easy identification of the interface specifications and technical requirements of the systems that reside within each specific frequency allocation, then it may allow industry to propose compatible systems that may co-habit the allocation - enhancing spectrum utilisation.

Such information will also be useful to those parties making EMC assessments, particularly for installations (see draft revision of the EMC Directive, EMCD 2000.8) where knowledge of allocations and systems local to the installation can be used to establish criteria for non-interference.

xiv. To what extent could intermediaries play a valuable role in buying rights to manage a particular frequency band and then selling access to parts of this spectrum to users on a commercial basis?

From a test and development point of view, it is suspected that intermediaries would complicate the licensing process.

It is thought that a single source of information regarding specific frequency allocations in a particular locality is required by the licensing authority to enable rapid assessment of the interference potential of any licence application.

The current system already takes significantly more time between application to licence issue / refusal, where block allocations have been made to some commercial organisations.

Conversely, those organisations having block allocations may have a need to dynamically allocate frequencies to the area / system as requirements change. A single source of information would assist in improving spectrum utilisation.

Possibly a live database could be operated, permitting the authority and intermediaries to view the current specific allocations and making changes that can be effective immediately. With such information at hand all licence application times might be improved. This might also be the same database suggested in the answer to xiii above.

Of course when deciding frequency bands for the intermediaries to manage, due consideration for the T&D licensing requirements should be made. As previously stated, manufacturers T&D requirements may not bare the same cost that service providers are prepared to pay. It is thought that intermediaries will only drive up the cost of T&D licences unless appropriate requirements are established in this regard.

8. Defence

xvii. Is this a valid description of the factors affecting defence use of radio spectrum?

From the viewpoint of a defence manufacturer convergence of requirements, bought about by interoperability issues, may lead to the need to test and demonstrate compliance at frequencies outside those allocated to UK MoD. Until total harmonisation has taken place, UK military allocations may need to cover all frequencies used by all coalition countries.

"Defence use" may also apply to use of the spectrum for test and development of military radio based systems for supply to UK MoD or other approved countries, by UK defence companies. Access to the customer country choice of spectrum for development testing, design proving and acceptance test is required. The spectrum requirements may differ from any defined in a harmonisation process.

9. Emergency services

xxvii. *Is this a valid description of the factors affecting use of radio spectrum by the emergency services?*

International emergency frequencies for marine and air may need to be considered within this section. Also mountain rescue, RNLI, Air-sea rescue and coastguard all use radio and may have interoperability issues to address. In some countries, including UK, Amateur Radio may be called upon to provide emergency communications (such as recently provided during a forest fire where neither emergency services radio nor the cellular phone system could provide the necessary communication links). Amateur Radio has also provided vital international emergency communications.

With a greater emphasis on spectrum efficiency and a possible move to one unified communication system (Tetra?) [except marine and air bands] the loss of frequency diversity may be important. That diversity may be maintained by a number of means, one of which is to reinforce the emergency service ties with amateur radio.

10. *xl. What remit should regulators hold over licence-exempt spectrum use, other ensuring that it does not interfere unduly with licensed spectrum use?*

Licence-exempt spectrum use should be specifically limited to non-critical and non-essential applications.

The largely unregulated use of low power, licence-exempt, systems means that such systems cannot be protected against interference from other users of equipment in the same licence-exempt spectrum allocation. The low(er) cost of such systems means that many users are domestic or SME's and are likely to be non-technical. As such, they cannot be expected to understand the implications of relying on the systems performance. Regulators should ensure that the users are informed regarding the risks of interference involved when using these systems.

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