

# **Radio spectrum management review: a consultation paper**

## **Legislative basis for spectrum management**

There is a need to consider if the present allocation categories as defined in the ITU Radio regulations, are still valid and meet user's requirements, particularly as the move towards digital systems and convergence is blurring the distinction between different types of services.

Some of the reasons for the current allocation segmentation are:

- Effectiveness of radiocommunications systems
- Dedicated spectrum required for certain services
- Provides uniformity to allow global services to be established
- Means of limiting interference
- Allows efficient use of spectrum
- Specialisation of equipment design
- Differing national requirements

## **Present validity of these reasons**

### **Effectiveness of radiocommunications systems**

The present allocation system was introduced to meet various requirements to ensure the effectiveness of radiocommunication systems. However the allocation system is now perceived to various disadvantages such as inefficient use of spectrum and is not effective where there is a blurring between services.

### **Dedicated spectrum required for certain services**

The present system provides dedicated spectrum for mobile services. There is now a blurring between fixed and mobile services and it is felt that a regulatory regime should be developed that permits closer integration of fixed and mobile. However it is recognised that some mobile services will require dedicated spectrum. Further studies are required to determine the most effective regime.

### **Uniformity for the establishment of global services**

The present system provides the uniformity required for international communication systems. It is felt that this objective may now be a constraint. Different countries have different requirements such as in Europe terrestrial links are required whereas in other parts of the world satellite links may be more important. Thus a system is needed that is flexible so that the different requirements can be met.

### **Means of limiting interference**

The present system is a means of limiting interference between different users. However this type of control may not be so important now. Various countries are developing different concepts for addressing interference between different systems and additionally digital systems are more tolerant of interference. Thus further work is required to develop new procedures for the toleration of some level of interference. There is also a need to look at the effectiveness of systems used in other countries. Some examples are:

The US market based system is supposedly based on clearly defined interference rights/protection and in certain cases operators are expected to accept a certain level of interference. Australia has a regime based on property rights in radio spectrum that includes an interference management framework. This is a mechanism based on emission limits and how much radiation other users can tolerate without suffering

undue interference. New Zealand introduced a system of spectrum rights where interference management has moved from a first in time mechanism to a dispute resolution procedure incorporating compulsory arbitration. In the Canadian spectrum pricing model interference is not really addressed though the pricing formula includes factors for spectrum exclusivity and spectrum saturation.

### **Efficient use of spectrum**

The present system is claimed to permit the efficient use of spectrum. A significant proportion of spectrum allocated to satellite usage is under utilised so this is not a valid claim. It is felt that the introduction of economic tools will lead to the more efficient use of spectrum. However there are still many issues to consider regarding the use of economic tools.

### **Specialisation of equipment design**

With the move towards digital systems there is little technical difference between the technical requirements for different types of services. A more flexible allocation regime is needed to reflect these technical developments.

### **Differing national requirements**

Telecommunication networks are evolving in a variety of ways now so that existing spectrum allocations can act as a constraint on innovative new services. Thus more flexibility in the spectrum allocation categories is required.

### **Spectrum trading**

When considering spectrum trading there is a philosophical issue to resolve first, particularly when applied to international usage, such as satellite systems, but some of the issues also apply to national spectrum usage. The philosophical point is does "ownership" of spectrum belong to the first entity to obtain authorisation to use the spectrum or does "ownership" belong to the country that uses the spectrum for communication purposes. Much of the traditional (ITU based) thinking is that the spectrum is an international resource with the first entity to use the spectrum having a form of qualified ownership rights. Now with the various new forms of satellite licensing concepts being introduced it appears that spectrum is becoming a national asset. Processes such as spectrum pricing support this trend towards national ownership of spectrum. There could be significant implications in this changing concept of spectrum ownership, which is a large and complex subject. Until recently it would appear that "ownership" rights belonged to the first entity obtaining authorisation to use the spectrum but the process was controlled by national administrations. This is the underlying concept in the ITU Radio Regs where various rights and obligations attached to such "ownership" are detailed. However recent developments appear to make national "ownership" of spectrum the concept that countries are beginning to adopt.

### **The Boundaries of Spectrum Regulation**

Earlier work by the Radiocommunications Agency on the use of licence exempt spectrum has been based on the concept of a possible division between public and private segmentation of the frequency bands. It is agreed that licence exempt spectrum can be considered to form two categories of usage but this division is based on usage of the spectrum rather than segmentation of individual frequency bands. The two categories based on usage are

- Firstly, the bands that could be used to carry third party traffic and these are the bands 1880 – 1900 MHz, 2400 – 2483.5 MHz and 5 GHz bands.
- Secondly, the other licence-exempt bands and uses where it is considered that the frequency bands are more difficult to use for the carriage of third party traffic and should therefore be treated differently.

There is a need to justify having different categories of licence exempt spectrum and the compatibility of this concept with a more flexible approach to the use of spectrum. For the frequency bands where it is possible to carry third party traffic it is considered that the usage parameters should be extended though the band should not be fully open to commercial traffic. Therefore it is suggested that the regulations should allow traffic to be carried between connected parties. In this context ‘connected’ could be interpreted as a group of companies within the meaning of Section 258 of the 1985 Companies Act as substituted by section 21 of the Companies Act 1989, or similar groups of entities. Where the parties are only connected for the provision of telecommunication services on a commercial basis then these parties should not be allowed to use licence exempt spectrum, an example of this relationship is ISPs providing a commercial service.

A fuller definition of ‘connected’ is where there is a pre-existing relationship between the entities involved and the provision of the link to support a telecommunication service between the entities is ancillary to the main relationship between the entities. In the consultation document paragraph 108 refers to greater definition of the rights and responsibilities of spectrum users. It is considered that this concept should be applied to the use of licence exempt spectrum though a different model needs to be applied to reflect the characteristics of licence exempt spectrum usage. Where the frequency bands could be used for carrying third party traffic then it is considered that the rights and responsibilities should be more stringent. The obligations should include the right not to claim protection from interference and the responsibility not to cause interference. The rights and obligations should also include enforcement and liability rules and information on ownership. It may be appropriate to have an online database where entities register their usage of licence exempt spectrum and the identification of users could lead to more stringent enforcement of the non-interference regime. It may be more appropriate to use radio technology rather than new regulatory tools to achieve more effective control of interference.

For the second category of licence exempt spectrum there is little risk of substituting for charged spectrum so this is not considered to be a significant problem. However for the first category there is a risk of substitution so there is a need to establish usage parameters that prevent this. There is a requirement to investigate if this can be achieved/enforced using radio technology. As part of this investigation it may be appropriate to determine why the use of licence exempt spectrum is so popular as it is felt that generally the cost of spectrum is not a significant barrier to usage.