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**RESPONSE BY THE WATER INDUSTRY
TELECOMMUNICATIONS ADVISORY COMMITTEE
TO THE
CONSULTATION DOCUMENT ON
THE USE OF LICENCE-EXEMPT SPECTRUM
FOR THE PROVISION OF PUBLIC TELECOMMUNICATION SERVICES**

INTRODUCTION

This response is provided by CSS Spectrum Management Services Ltd., on behalf of the Telecommunications Advisory Committee (TAC).

TAC has been established for over 15 years and represents the interests of the United Kingdom Water Industry on a range of matters related to Mobile and Fixed Communications and Radio Scanning Telemetry.

The membership is drawn from representatives from the following Industry Groups:

- 10 main Water Service Companies
- 15 Water Supply Companies
- 3 Water Authorities in Scotland
- Environment Agency
- Dept of Regional Development Water Service Northern Ireland

The Water Industry (WI) has been a major user of Private Business Radio systems. The majority operated analogue trunked radio systems but as these systems reach the end of their economic life, increasing use is being made of Public Cellular Services, provided by the UK operators on the GSM 900 and GSM 1800 systems.

The Water Industry is a major user of licensed Radio Scanning Telemetry systems which are designed and assigned to RIR 2037 or MPT 1411 specification which is a licensed band. The WI also makes considerable use of the de-regulated telemetry bands. Due to the large number of users in many geographic areas it has become necessary to change the use of this licence exempt equipment from real time control and data gathering to that of the collection of non critical or archive information.

The Committee has provided input into the various stages of the Spectrum Review and the resulting Consultative Documents leading to the 1998 WT Act. It has also responded to a number of relevant Consultations which have been produced since then.

Management and support for matters related to Water Industry mobile communications and Scanning Telemetry are provided by CSS Spectrum Management Services. This relationship provides the RF engineering and planning necessary to ensure that the most effective use is made of the radio spectrum. CSS also acts as a focus for the Industry and deals with financial and regulatory matters related to RA, DTI and Oftel.

The members of TAC have, for many years, recognised the need for effective use of the radio spectrum. This has been demonstrated by the shared use of spectrum and radio systems during the past twelve years. The members are keen to explore the range of emerging technologies and the various ways in which the technology can be used to provide more efficient and cost effective voice and data communications for the WI.

GENERAL OBSERVATIONS

The introduction of licence exempt bands has been a clear success and been of benefit to users and manufactures.

In fact in certain bands, such as the two used for remote telemetry this strategy has been a victim of its own success.

The uptake of PMR 446 and the migration from CTI (Cordless Telephone) to DECT are clear examples of the benefit to be derived from licence-exempt spectrum.

The laws of physics in relation to radio signal and propagation cannot be changed. The use of intelligent equipment can greatly increase the packing density in a given area. However the new technology cannot necessarily be used in conjunction with existing modulation and transmission techniques. In order to derive the maximum benefit from intelligent equipment it will be necessary to ensure that equipment of this type should be used in the same geographic area and on designated spectrum for this type of technology. It would therefore seem logical to introduce the new technology in new allocations of spectrum.

An area of risk associated with licence-exempt spectrum is the lack of control in relation to the number of units being deployed in a general area or to have no knowledge of how many have been sold or installed or in what area or how many may be added in the future.

PRACTICAL PROBLEMS

The WI and many other organisations wishing to make use of licence-exempt telemetry equipment are now having considerable difficulties due to the continued growth in the use of de-regulated telemetry. Many organisations put into place well engineered systems with high quality directional aerials and using equipment from established suppliers.

Many systems have operated well until additional users have set up new links in the same area, which of course they are quite entitled to do. The end result is that a link or a number of links can become unreliable or unusable due to interference.

For de-regulation to be extended and to deliver the desired result there must be some form of longer term protection.

If the decision is made to enable public service providers to make use of licence exempt spectrum the RA may wish to consider a requirement on the equipment manufactures or suppliers to provide two types of information labelling:-

1. The Supplier should advise the customers that in areas of high usage of this type of equipment that communications difficulties may occur due to heavy loading of the spectrum by large numbers of users.
2. In order to have the option to control the use of the particular blocks of spectrum that the period of the licence exception should be limited to say 5 years. However in practice this would be a year on year rolling time restriction, except where a point is reached where the particular band cannot support any additional users and the licence and therefore the supply of equipment could then be withheld for an agreed period.

THE PRINCIPLES OF THE CONSULTATION

From a general viewpoint the WI supports the principle of a more flexible approach to access to licence exempt spectrum. However there must be sufficient spectrum available to provide a level of service to all users which will ensure that their investment in equipment is worth the benefits provided by that equipment.

The option to enable public telecommunications operators to make use of this service must be based on calculations which can prove that the majority of users will be able to make use of the service for a high percentage of the time, perhaps 95%.

The consultation document assumes that the respondent has knowledge of usage within a band. In order to validate this consultation the RA will have to provide information about the level of usage of the spectrum or the criteria they used to identify the current non public use of the spectrum.

There are clearly benefits in making a service available for more users via licence-exempt spectrum. It is likely to benefit the manufactures, suppliers and prospective users. The growth in wireless office peripherals using Bluetooth, or Hyperlans could be the start of a new concept in delivering service to the desk. However we must not lose sight of the fact that some organisations have paid for their licences to offer a services or they will have made a considerable financial investment in infrastructure and equipment on the basis that they will be one of a limited number of organisations offering their type of service. It should be recognised that a service provided by a licensed organisation could be expected to deliver a service to a guaranteed service level.

RESPONSES TO SPECIFIC QUESTION RAISED IN THE CONSULTATION

Q1: What are the potential gains and benefits to the UK of allowing commercial services in licence-exempt bands, in terms of new innovative services (business models), promoting competition, and making Britain the best place to do e-business?

One of the essential ingredients required to ensure that e-business can grow and flourish is reliability. The more that an organisation relies on e-business and e-commerce the more reliable the systems must become. When all transactions are electronic and there is a systems or communications failure there is often nothing that can be done other than to wait until the problem is resolved. To base a business model on a system which uses deregulated spectrum which could become unreliable does not make good business sense. The problem could be compounded as the initial users of licence exempt spectrum within an area are not likely to have problems until the density of users increase. This is likely on business parks where there can be large numbers of high tech organisations in a relatively small area. Much of the protection and coding used in wireless systems avoid corruption of the final message or mis-routing of the information. However for this to work there needs to be enough free spectrum to enable the basic transmission and reception to take place in real time. If an organisation commits to a wireless approach which operates for some time and subsequently becomes unreliable it can be costly in lost business operating time as well as purchasing a replacement system.

Q2: Will the introduction of public telecommunication services into existing licence-exempt frequency bands, within the conditions of use identified in Appendix B, result in unacceptable levels of interference to existing users, and if so, in what geographic locations might this be expected?

It is felt that this question is far too broad in its current form and in view of the large number of consultations being produced by the RA and DTI there may be many organisations which may not have seen the consultation or have had the time to consult within its user sector to provide an answer which reflects the true situation. As mentioned elsewhere in this response only the areas of interest to the public operators should be considered at the initial stages. If this approach is not taken a general view could be formed which does not reflect the best interests of the users and organisations that support them.

Q3: Would the introduction of public telecommunication services, into existing licence -exempt allocations, and within the current conditions of use identified in Appendix B, result in congestion of the frequency bands?

As stated previously this is too broad a question to ask without identifying the users of the spectrum.

In relation to the Telemetry bands at:-

173.35 to 175.1MHz

417.90 to 418.9 MHz

433.05 to 434.79 MHz

458.50 to 458.95 MHz

These bands are suffering congestion in certain locations and in many instances where reliable telemetry data is required users are migrating to licensed bands.

In view of the current congestion in these bands it would not be appropriate to open them up to public telecommunications operators.

Q4: In bands where channel access techniques have been identified for specific services, will these techniques be sufficient to avoid future congestion? If not, please give information about other techniques that might be applicable.

We accept that a number of channel access techniques are available and that they will make effective use of spectrum. We have some concern over the ability of the radio channel to handle the volume of data which could be generated from a number of organisations in a given area such as business parks. Although a large number of users will have access to the system their aggregate speed and throughput per user will be reduced, dependant upon the number of users on line and the type of data being sent.

Q5: What type of public telecommunication services could be offered in licence-exempt spectrum and what is the anticipated market potential?

It is assumed that in order to provide an acceptable level of service (see our comments in the conclusions) the majority of the business opportunities will be in relation to in-building systems where there is a degree of control over the number and location of the users and lack of interference from other systems.

Many of the issues may be similar to those raised in relation to Unbundling the Local Loop.

Q6: Assuming that there would be a lower quality of service available from public telecommunication services using licence-exempt spectrum, compared to those using licensed spectrum, how could potential end users be informed of this?

This point has been raised in our conclusions, but in summary, there will need to be a level of labelling, or voice announcement. In addition

you would expect a reduction in cost if the licence-exempt spectrum forms part of an end to end service.

Q7: Which, if any, frequency bands identified in Appendix B are not suitable for the introduction of public telecommunication services and why?

The scope of this question is very large and should be considered when a need for use of this spectrum has been identified.

In practice in order to pass any volume of information over a radio system there will be a requirement for a finite amount of bandwidth to support the service. In general a public service has a larger potential user base than a private system therefore the bandwidth requirement will be higher. It would seem likely that only an allocation above 1GHz would be able to support the potential traffic.

Q8: Are there any potential problems associated with allowing commercial services in licence-exempt spectrum?

The underlying objective of any public telecommunications operator is to make a profit for the benefit of the organisation, the shareholders and the staff. With a private organisation the drivers may be different, the use of the radio spectrum may form a small part of a larger process or service.

It might well be difficult to identify who will benefit the most from the use of the licence-exempt radio spectrum. There will need to be a balanced judgement made on the merits of the use or otherwise of licence exempt spectrum. Once the option has been given to public telecommunications operators to use this spectrum it would be very difficult to take it back. It is suggested that the need, value and benefits of the relaxation in the licence exempt band should be considered on a case by case basis.

It may be necessary to develop a set of criteria to measure the relative benefits and difficulties which might result from the use by public operators of the licence exempt band.

Q9: Assuming that public telecommunication services are permitted in licence-exempt spectrum, what would be considered suitable time scales for making these changes in each of the bands identified in Appendix B?

As stated elsewhere in this response, in order to make the most effective use of the spectrum and not to restrict the current users of this spectrum it will be essential that equipment using new technology be used to share the spectrum. When considering polite or self protecting equipment it is important that any equipment introduced this way must comply with an ETSI or similar recognised standard to ensure that all

users have an equal opportunity to take advantage of this spectrum. In addition the case to illustrate value added by the use of this spectrum must be produced for the band in which a Public Telecommunication Operator wishes to operate.

SCOPE OF LICENCE-EXEMPT SYSTEMS

As there is no means of policing deregulated spectrum and in view of the volume of equipment which could be brought to the market it is considered that use of licence exempt spectrum via a PTO should be confined to in-building systems. This will enable the User organisation to identify and rectify or at least deal with what is essentially an internal problem.

It might be appropriate that on a large a business park a local management organisation be nominated to overview the situation and deal with interference problems which might radiate from within buildings due to their physical construction and the number and location of aerials within the building.

CONCLUSIONS

The scope of this consultation is very wide, in fact it is too wide for any one organisation to provide an informed response based on practical knowledge from a users or suppliers perspective of band or section of the licence exempt spectrum under consideration.

Where the public operators consider there is an opportunity from a commercial and user perspective to have access to licence exempt spectrum, a consultation in relation to that particular requirement only should take place.

In principle the WI supports the controlled use of deregulated spectrum by public telecommunications services, however there are a number of criteria which should be considered on an application by application basis.

1. There must not be any known congestion in the band under consideration.
2. Any equipment used must be spectrally efficient and use new intelligent technology.
3. The Intelligent equipment must comply to an ETSI or similar standard to ensure that equipment from different manufacturers can co-exist without causing interference or limiting the operation of other equipment in that band.

4. Where possible the RA should consider an extension to an existing band in order to ensure that the intelligent equipment can operate within the same sector of the band. Where this is not possible the equipment must not interfere with or limit the operation of existing equipment. This approach is required in order to protect an organisations original investment.
5. Where an organisation has been granted a licence to operate a similar service there may have already been a considerable investment made in the form of a Licence fee or investment in infrastructure, the RA must consider, via a consultation process if the inclusion of the use licence-exempt spectrum would be fair and equitable to all parties.

There does not appear to be a common answer to these points, it is clear that some bands in the spectrum will lend themselves to being shared by the public and private sectors.

It is clear that the service that is provided must be reliable and the users must have confidence that it will stay that way. A public operator provides a public service and as such should contract to provide a level of service at a cost. In relation to this issue it is felt that Oftel has a role to play in this and subsequent consultations which might evolve from this initial consultation.

It is difficult to see how a public operator can provide the levels of service to a range of customers over a medium over which they, or any regulator does not have direct control.

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