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ASP Response to the review of Radio Spectrum Management by Professor Martin Cave

In replying to this report ASP has brought to bear the expertise of its members and own experience in spectrum management. ASP was formed in 1986 as a direct result of the DTI Mclaughan report on spectrum management of the independent sector of the entertainment industry. Since 1986 ASP has been an active participant in the UK and European forum dealing with the various aspects of spectrum management. In 1989 it started the first private radio licence distribution service (ASP FM) on behalf of the DTI / Radio Communications agency. It has contributed to all 3 Detailed Spectrum Investigations undertaken by CEPT, and taken part in the CEPT committees dealing with these and associated issues. In order to facilitate the spectrum licensing ASP FM initiated work on European standards for a range of broadcast devices and at present chairs ETSI ERM TG17 and CENELEC TC106 working group 7 dealing with broadcast and ancillary equipment.

Given the size of the report and the time required to reply to each point, we have restricted ourselves to general comment and some specific responses.

The review has been one of the most difficult documents that has been our misfortune to read. The constant repetition and "cut and paste" from other reports makes it extremely difficult to fully comprehend the point Professor Cave is trying to make. In brief the report has not grasped the basic facts that radio spectrum is a tool for industry and that the complex jigsaw of international regulation facilitates use of the radio spectrum without undue interference, or the interaction of standards and directives reinforcing the "non-interference" perspective. It has not taken a wider view of the use of spectrum auctions and does not appear to have taken into account the disastrous effects of the 3G spectrum auctions, precipitating a cash flow crisis, initially on the companies concerned and subsequently on the worldwide telecommunications industry. Whilst the Treasury received an inordinate amount of money from the auction, the public purse has also had to pay for the number of people unemployed as a direct result of the auction, and the resulting spread of this malaise to their suppliers and subcontractors. If this is an excellent example of spectrum pricing as put forward by Professor Cave, I do not believe that the UK economy can afford any further experiences.

A second result of the auction and its disasters effect on the cash flow of the companies concerned is the delay in implementing a full infrastructure for the 3G radio systems. From information available at present it appears that other European countries will have full implementation of their 3G infrastructures prior to the UK. This of course means that those countries will enjoy the economic advantages before UK industry.

The cost of the 3G licences will ultimately be borne by the users.

The general theme running through the document is a nationalistic approach to the use of radio spectrum. Radio is one area where greater harmonisation with Europe makes sense both at economic and technical levels. If pursued it will undo the careful progress made over the past 20 years. A second result will be the increase in unlicensed use, which in turn will cause interference to legal users.

An area that has not been addressed in the report is the reaction to many people of licensing. As ASP FM we had personal experience of these views, which are deeply held or regarded as a commercial expedient. This view is that the radio spectrum is a God given resource and Governments have not the right to gain benefit from its use. The reality is most unlicensed use of the radio spectrum is unlikely to be detected and the users apprehended without a phenomenal expenditure of time and money. It would also be interesting to see a test case in the European Court of Human Rights if the spectrum pricing proposals are implemented and many users find themselves unable to continue their legal use of radio within their professions.

Executive Summary

2) "The Review was charged with advising on the principles that should govern spectrum management."

It would appear from the body of the report that only those spectrum management tools involving "money" as a determining factor have been considered. Whilst there are undoubtedly areas of inefficient spectrum use, the vast majority work in a reasonable manner and are appropriate tools for the industries concerned. Consideration has not been given to strengthening independent licensing companies, trade associations and similar ways forward which would involve experts from within industry running systems for the benefit of the industry without incurring the crippling costs of spectrum auctions. Radio spectrum is as essential to UK industry as the quill pen, ink and paper to the 18th century finance houses. Pricing spectrum out of the economic range of the UK industry as has been effectively achieved by the 3G auctions will do nothing to increase spectrum efficiency or the ability of UK industry to new challenges.

From the experience gained from the licence distribution of ASP FM and subsequently JFMG for the broadcasting and entertainment sector, there is scope for increasing spectrum efficiency by the use of correctly priced short and medium term licences. Competent spectrum planning allows reuse of spectrum in some cases as close as a few hundred yards to be achieved. These systems are technically based and rely on industry trusting the organisation issuing the licence to provide an interference free service at a cost commiserate with the work to be undertaken. With the present advances in computerisation these organisations could just as easily be run by the RA as industry.

3) It is interesting, having read Professor Cave's views in the review, to have read Ofcom's views expressed in an address to the IEE, these appear to be diametrically opposite to those of Professor Cave.

4) It is unfortunate that we were unaware of the preparation of this review, as were many in the radio industry. It appears to be the case that government organisations consultation is simply placing information on their website, whereas previously in the days of pen and ink, information would be disseminated to those subscribing to various interest groups and lists. With the plethora of web sites and computer-based information in the radio and telecomms sector, it is not possible to regularly review all of these sources. We would request consideration of this problem and perhaps a return to some form of list based dissemination. In this the age of e-mails it should be achievable without significant cost.

6) "Success in managing access to radio spectrum should thus boost the performance of the UK economy".

Conversely pricing industry out of the radio spectrum will damage UK economy.

8) For effective spectrum management the technical areas of the Radiocommunications Agency/Ofcom will require to be strengthened especially through the current period of changeover from analogue to digital services. These being on the whole mutually exclusive, on the same or adjacent bands without appropriate guard bands and detailed technical considerations.

9) The use of a specific part of the radio spectrum at a specific site is defacto a monopoly. It requires a combination of strong central regulatory approach with technical mechanisms to ensure efficient re-use at the shortest practical distance. In this review pricing appears to be the only mechanism considered. Whilst this may enhance treasury receipts for a period, it may not necessary enhance spectrum efficiency.

11) "International Co-ordination"

The harmonised use of spectrum across Europe has enhanced the ability of UK manufacturers and service industries to provide cost effective solutions to a much wider marketplace. Any consideration of "the constraints, which this imposes on spectrum management in the UK" must be carefully considered and weighed against the loss of existing markets.

“Investment in equipment”

Careful consideration of both the economic benefits and interference potential of new technologies need to be assessed before rejecting international agreements. Within the committees preparing such recommendations and regulations, the UK has had a major voice and under Ofcom must continue to strengthen the UK position. Local re-allocation would have detrimental effect on the UK's industry's ability to respond to world markets and will undoubtedly mean retaliation from other Countries.

12) Over the last 12 years Europe has moved from a system whereby national Administrations imposed local regulations, spectrum allocations, standards and testing. From the point where a piece of equipment could have to undergo some 43 separate tests and applications on different frequencies before being sold throughout Europe. and there were few if any commercially harmonized spectrum bands for non-safety orientated equipment within Europe

To a system of harmonised standards and in many cases spectrum with the emphasise on the ability to place equipment on the market in the shortest practical time.

Whilst CEPT, ETSI and the EU may not operate in as short a time-scale as perhaps we would wish the “sharp acceleration” has so far been accommodated in a reasonable harmonious and practical manner. Spectrum management is by its nature a conservative beast and any rate of change has to be commiserate to ensure continued non-interference to the maximum number of users. There is increasingly a case for a single European spectrum management authority in order to prevent national remedies interfering with the rest of Europe. The EC has already started this process and with their market based prospective may well achieve considerable gains in spectrum efficiency.

13) We believe that a misunderstanding of a spectrum managers role has been placed in this paragraph. As stated in 12) increasingly Radiocommunications Agency has facilitated the harmonised co-existence of disparate services in both the commercial and public sectors. This must be carried out with a high degree of technical consideration and cannot simply allow market supply and demand to rule. Relying on such a system will ensure the worst possible world for all users.

14) “Demand for spectrum”

Whilst this may have been the case some years ago the RA along with National and International investigations have had a major impact on this problem.

“Interference Management”

Work carried out mainly within CEPT involves administrators, new and existing users plus industry. The results do not always favour incumbents' interests.

15) Whilst there are some deficiencies in a central planning approach, due to the very nature of spectrum management, the damage that can be caused by a wrong decision to users and industry should not be underestimated. Supplanting this approach with a money-oriented approach will not magically make existing problems go away.

There appears to be a perception that anything digital must be more efficient. This is not necessary an accurate statement and a series of factors need to be taken into account on a case-by-case basis. The number of channels in a given piece of spectrum also needs to be balanced against the out of band emissions, quality and other factors. To date voice systems have on the whole become more efficient with use of digital technology but other wide band transmissions are not necessarily as efficient.

16) “Regulatory Burden”

Hoarding is increasingly being eliminated by the effective use of the RA's monitoring sites and mobile monitoring units.

Whilst there is undoubtedly hoarding of spectrum in some areas, the answers proposed by Professor Cave are extremely unlikely to provide an efficient answer for UK industry. Ultimately the phenomenal increases in cost engendered by spectrum pricing will be borne by the consumer and taxpayer. Whether this is by Public Purse via the MOD, Police, Fire and other Public Services or in direct costs to the consumer. Whilst the amount of radio spectrum used by professions, such as Astronomy have caused considerable heated debate within CEPT and ITU over the years, it cannot

be disputed that their necessity to the long term future of the human race. The majority of this work is carried out by Universities and other seats of learning, existing on small budgets, again mainly from the Public Purse. To divert a significant part of this budget to the Treasury appears to be a totally useless and circular exercise. *Is Professor Cave wishing to stop this work in the UK?*

In addition the international nature of this work and the regulations appertaining to the spectrum involved mean that international condemnation of the UK government would undoubtedly result in any move to price or reallocate this spectrum.

“Inefficiency”

National regulatory requirements have increasingly been replaced by European harmonised *minimum* requirements, which are biased towards economic issues.

“Ineffectiveness”

The European organisations have adequately responded to the rapid pace of change. Under the present systems all the technical and economic issues are considered and as far as practical spectrum is shared allowing access to as many users as required. The days of “exclusive “ spectrum (except in the case of some safety of life services) are long gone.

Recommendation 4.1

We were amazed that a document prepared and published for the Department of Trade and Industry and Her Majesty's Treasury should put in print that Her Majesty's Government should be “flexible” in their approach and implementation of international agreements. This statement flies in the face of the present reputation gained by the Radiocommunications Agency for fairness and accuracy in their implementation of these agreements. These agreements have (from personal experience) been hammered out as a compromise between the competing requirements of national administrations, users of other parts of the spectrum, and the state of technical advancement within that spectrum plus the new entrant. Any renege by the UK Government would generate a backlash from users in other countries to the detriment of UK industry and users. It should be borne in mind that for at least the last 12 years there has been a continuing process of harmonisation and standards to, in the words of the European Commission, to “allow free access to the market”. This process has been painful to all concerned and has resulted in a much flatter playing field from which UK industry has been able to launch exports to the European marketplace. This process is taking longer at an International level but is slowly gathering momentum. The proposals in the report appear to be a massive step backwards from this position of a flat playing field and again we repeat that this will result in a backlash against British industry and waste an inordinate amount of time and resource within the European and International forum when that effort should be focused on creating spectrum management suitable for world use (and thus exports)

Recommendation 4.2

I was under the impression that this was already carried out by HM Government!

Recommendation 4.3

Study of the harmonised standards would have shown that this is already the case. However some technologies do not mix this has proved to be the case between the majority of analogue and digital systems.

Recommendation 4.4

By its very nature a successful “harmonisation” will result in many millions of devices being in use throughout Europe. Users will be extremely unhappy to wake up one morning and find their equipment will not operate due to a new service licensed by the UK.

Perhaps the review team should have examined how this matter is being dealt with at present before making this recommendation, CT2 has shared spectrum for a number of years with compatible devices and will be phased out over the next few years. This process has meant that those companies investing in a cordless PABX will have full use of their investment over the life of the equipment whilst millions (yes millions) of cordless audio and short-range devices share the same spectrum

Recommendation 4.5

This recommendation is some 12-14 years out of date the organisation is called ETSI, and has successfully achieved the objectives of this recommendation.

Recommendation 4.6

This recommendation does not take into consideration the problems and expense of the present system where for example a travelling pop concert or theatre show must obtain a separate licence from each national Administration on whose territory it will operate. Various Administrations have time scales ranging from 6 weeks to some few months. For travelling use a central licensing authority would be an economic benefit.

5 Interference Management

Having personally worked in spectrum management and especially radio interference investigation since the mid 1960's, the context of interference management expounded by Professor Cave is fundamentally flawed. Without a well funded, well trained engineering based organisation to oversee and police the UK radio spectrum the use of radio systems will rapidly become untenable. If we look at the experience gained by the introduction of TETRA for Public Services, this has raised many interference issues for a range of users, especially the many millions of short-range devices used by the general public. The laissez-faire proposals put forward in the report will result in many who use radio equipment as a tool in either their public or private life, having this tool effectively removed either by interference or pricing. *Is this the way to help UK industry?*

Much emphasis is placed on the use of standards to ensure interference free use of spectrum; this shows a basic lack of understanding of the purpose of radio standards. At present the majority of documents appertaining to harmonised radio standards are produced by ETSI in response to mandates from the European Commission and are intended to provide a route for manufacturers to place equipment on the market throughout Europe, these specify the minimum requirements to achieve that objective. The most recent mandate is under the R&TTE Directive, which explicitly excluded receiver parameters in any but a few exceptional cases. If Professor Caves proposed system is to operate with spectrum owners managing any interference issues either to or from their spectrum, the issue of receiver parameters is key to its success. However under the directive, National Administrations have very limited powers to require any additional technical parameters than those in the part 2 of the harmonised standards. This is one minor problem in managing radio spectrum under existing standards.

If the Cave Review is implemented it is essential that a high quality, Technical based body is in place to oversee the major problems which will ensue between users and to ensure that the terms of any licence fully reflect the technical responsibility of that user and that small users are fairly treated. Will a 3g operator who has paid millions of pounds for there spectrum be interested in an interference complaint from say a PMR operator?

Recommendation 5.2

This has been discussed many times but a major stumbling block has been the data protection Act. Professor Cave has made no recommendations to amend this legislation.

Recommendation 6.1

This is one of the few recommendations on which we would agree, but "the overall value by society" may not result in large amounts for the Treasury will this be acceptable under the proposed regime? Definitions of terms such as "maximise" and "efficient " in the context used would greatly assist in understanding the import of this recommendation1

Recommendation 6.2

The committee should be expanded to provide wider representation.

Recommendation 6.3

Once we move away from the technically based judgements to purely political ones how do we ensure that we can conform to International agreements on field strengths etc? Will The EMF issues be taken into account?

Recommendation 7.1

This recommendation is likely to clash with recommendation 6.1.

Recommendation 7.2

Isn't this looking back many years? Great pity that Professor Cave did not look at the better parts of European harmonisation, the R&TTE Directive has changed the system with interface regulations for the majority of licences.

Recommendation 7.3

Whist there may be some arrears of spectrum where spectrum trading can take place, protection for public and business users must be in place before it starts.

This recommendation appears to condone the deliberate breaking of International agreements is this correct? If so the problems would probably far outweigh the advantages.

Recommendation 7.5

This recommendation appears to contradict itself.

Recommendation 7.7

Given the economic results of the 3G auctions to an industry which has never known recession, this appears to be the best method of completely eliminating UK industry.

Recommendation 7.8

This appears to be the best way of achieving another monopoly as happened with the cable companies, is this the objective?

Recommendation 7.9

This recommendation is likely to clash with recommendation 6.1. as at present many traditional spectrum allocations will be sought by those organisations with the cash to do so. Leaving aside the present problems of 3G this recommendation could result in mobile phones consuming the majority of spectrum.

. Recommendation 8.1

Greater consideration should have been given to the Hunt report produced in the 1970's which basically said if you can use a cable do not waste radio spectrum. With the almost unlimited capacity of fibre optic cables this should be reinstated as one of the "tests" before spectrum is allocated.

. Recommendation 8.2

We are not sure of the meaning of this statement, RLANS at 2.4GHz have proposed this but as a general statement it spells disaster for individual users of short-range devices. The proposed licensing of a UK wide asset tracking system by the RA would have caused interference to many thousands of Short range devices. Does not this clash with 6.1?

Recommendation 8.3

Which restrictions are referred to? All the restrictions on the majority of PMR licences are technical constraints to enable the spectrum efficiency Professor Cave wants
Under this recommendation how would the small user fare? Will a small taxi company already facing a large licence fee be driven out of business?

Recommendation 10.1

Does professor Cave understand the import of his recommendation, We are sure the various terrorist organisations would welcome this along with many other Administrations outside Europe

Recommendation 10.2 -4

As 10.1

Recommendation 11.1 –11.6

The broadcast bands are a complex interaction of many uses not simply TV transmission, Spectrum use by PMSE, repeaters and Astronomers are but the tip of the iceberg. Referring to recommendation 6.1” will the value derived by society “ from live performances of theatre and concerts be the prime mover in allocating this spectrum or the “spectrum efficient” new technology with the cash to pay a large fee? If the production of programs and films becomes uneconomic through the large licence fees or unavailability of spectrum it is likely that this part of the UK economy will move to a country which will have a more realistic approach.

A second area of concern is the proposal that the band should be opened to other uses, one of the limiting factors in sharing this spectrum is the quality of the television receivers which have not been subject to strict standards for the rejection of unwanted radio transmission’s

Uncertainty about the availability of spectrum for PMSE activities has produced a major decline in equipment being purchased, with detrimental effects to the workforces of the UK companies involved. Early publication of the Governments intentions will greatly assist manufactures and users.

Recommendation 11.7

A single planning authority for all TV spectrum would be of great benefit, but whilst the BBC is funded from the licence fee it appears unreasonable to penalise the general public by increasing their licence fee if the BBC are perceived to be uneconomic with their use of spectrum.

Recommendation 12.2

At present you cannot reduce the spectrum consumption of radar without seriously hampering its mission., as the sky’s are increasingly crowded this recommendation needs to be treated with a great deal of caution.

Recommendation 13.1

This again appears to be a circular argument the public services are paid for by the public purse, Increasing licence fees simply reduces the money available for there prime function or their budget is increased to pay for the licence fees. Is this the reason behind the additional funds for the NHS?

Recommendation 13.2

Whilst having laudable intentions this recommendation ignores the requirement of compatibility and interoperability between equipment used by these services and the caveat on the use of 380-400MHz.

Recommendation 14.1

This again appears to be a circular argument the public services are paid for by the public purse, Increasing licence fees simply reduces the money available for their prime function or their budget is increased to pay for the licence fees.

Many investigations have been carried out into the potential for sharing the radio astronomy bands with other users (please refer to the ERO web site for details) To date in spite of these investigations no simply method of sharing has been found that will not destroy the very purpose of radio astronomers. Any reallocation in these arrears is likely to generate interference on a European and worldwide scale.

15 Implementation

We cannot find any reference as to who will be involved in the various stages spectrum planning or setting the parameters:

Will this be open to all or kept behind closed doors?

Will compensation be available for those disadvantaged?