



JRC Response to the Independent Review of Radio Spectrum Management By Professor Martin Cave

Key Points

- ❑ The report conveys the impression that only the public sector uses the radio spectrum in support of essential services. This fails to recognise fully the importance of the radio spectrum to private sector organisations delivering public services, such as the transport sector and utilities. [Rail, bus and coach industries as well as airlines and maritime sectors; gas, water and electricity industries.]
- ❑ The report does not recognise adequately the role played by non-government spectrum management organisations which exercise responsibility for management of radio spectrum in support of a number of key industrial and commercial sectors [referred to in paragraph 44.], and the potential for private sector organisations to play a greater role in spectrum management.
- ❑ The report must recognise that to date, spectrum pricing has only been applied at the assignment level, whereas it is more important to allow spectrum charges to influence allocation decisions. [Where historically small allocations have been made to services, congestion is a problem; where large amounts of spectrum have been allocated, there is little congestion. Spectrum pricing thus far has penalised those services with little spectrum, rather than allowing spectrum to be reallocated: the table on Page 10 of the report illustrates the point if Broadcasting Act Licence fees are discounted.]
- ❑ The report continues the confusion in broadcasting whereby Broadcasting Act fees are aggregated with spectrum access fees, breaking the essential link between price and use of spectrum. [Broadcasting Act Licenses offer no incentive for reducing spectrum use or sharing with other users.]
- ❑ The report offers no evidence for its conclusion that “Prime Spectrum” is 300 MHz to 3 GHz (Para 18). This omits large tranches of spectrum where severe contention exists between potentially competing users. [For example, at the lower end, it omits all sound broadcasting spectrum, the contention between terrestrial land mobile radio and mobile satellite services for access to VHF spectrum, and contention between Power Line Carrier and HF radio users: at the upper end, it omits satellite TV, and most terrestrial and satellite fixed link bands.]
- ❑ The report fails to address significant commercial users of the spectrum who currently do not pay any spectrum access charges but impact on those paying spectrum access charges (most importantly the mobile satellite service).

Detail comments

Para 44: “The Joint Radio Committee of the Fuel and Power Industries” was superseded by “The Joint Radio Company Ltd” in 1994. [Similarly the “Joint Frequency Management Group” has changed.]

Para 49: The differentiation between marketed and non-marketed services may not be the best way of distinguishing between users (which is also addressed later in this response under issue xv). Many private sector organisations have to fulfil statutory and regulatory requirements, and radio may be the best means of delivering a service in the public interest. By way of example, use of radio to support essential road excavations can speed up the process by allowing more rapid deployment of temporary fixtures, eg traffic lights, and the elimination of cables reduces hazards for the general public.

Para 72: It may be cheaper for broadcasters in some circumstances to give away digital boxes to consumers in order to save running costs and turn off relays, more so if a corresponding reduction in WT or Broadcasting Act Licences could be offered.

Para 74: Broadcasting Act Licenses give no incentive to reduce spectrum usage.

Para 84: It should not always be assumed that digital technology is more spectrally efficient in delivering a given service. Comparison between T-DAB and analogue FM broadcasting for local sound broadcasting is instructive, the more so when business factors are taken into account.

Para 92: If the Emergency Services are to be charged market rates for their spectrum, it is reasonable to allow them to share that spectrum on a commercial basis where it does not adversely affect their operational efficiency.

Para 93: Industry can confirm that RA has been in the vanguard of national spectrum management authorities in introducing economic incentives on users, even if users have not welcomed the process.

Para 94: The open and consultative approach by RA over a period of years has been much appreciated by industry.

Para 98: Unless spectrum pricing influences spectrum allocations, it will be of very limited value.

Para 100: Rollout guarantees are of limited benefit in the development of a network. If the business will support it, an operator will want to extend coverage to 90% of a population as quickly as possible. If the business experiences difficulties, the rollout provisions in the licence will be unenforceable.

Para 110: As discussed in the response to issue xxxiii, the Review needs to consider the impact of commercial organisations seeking to maximise their return in a spectrum trading environment. In particular, an organisation with surplus spectrum in either the time or location domain will price the product below the “market maker” (RA) if the marginal cost of

assigning that spectrum is below the resale price. It will thus be important to ensure that artificial constraints are not placed on the ability of private sector organisations to assign spectrum as was postulated when government commissioned earlier studies by CSP International.

Para 115: As mentioned above, any move to spectrum trading must not be encumbered by excessive restrictions on the licensee's freedom to exploit the product.

Para 117: The EU has postulated that only spectrum which has been auctioned should be subject to secondary trading. It is difficult to see a strong rationale for this proposal, and it would encourage speculative accumulation of spectrum rather than exploitation of a scarce resource in the national interest.

If there were concerns that organisations which had obtained spectrum through administrative processes were adversely benefiting unfairly, limitations could be imposed on the trading of privately managed spectrum through restrictions on the proportion of the holding which could be traded, eg no more than 25% to be traded based on a geographic, time or frequency basis.

Responses to specific issues for discussion

v. A separate statutory duty on OFCOM in respect of spectrum management would be helpful to mandate OFCOM to take into account the national interest in making decisions regarding the issue of radio licences, and to impose a statutory obligation on OFCOM to act reasonably in the amendment, change or withdrawal of radio licences.

vi. A licence granting access to specific blocks of spectrum (as alluded to elsewhere in the report) is a useful concept in dealing with licensing of large numbers of terminals (for example automatic reading of utility meters by radio), and for consumer terminals with no infrastructure in the country (eg satellite television and mobile satellite service).

viii. The UK must adopt a more flexible approach to international agreement. Historically, the UK has tended to impose more stringent interpretations of international agreements than other countries. For example, the UK interpreted the EMC Directive as preventing self certification by manufacturers of products incorporating radio devices, to the detriment of UK manufacturers, whereas most other countries interpreted the provisions as permitting self-certification. In the interpretation of the NATO agreement surrounding use of the spectrum 380-400 MHz, the UK has imposed a limited interpretation of what constitutes "Emergency Services" whereas other signatories have taken more account of their own national interests.

x. A pragmatic approach is necessary. It may be helpful in specific cases to identify a block of spectrum and reserve it for a particular technology, as in the case of GSM, but not always. In the case of Tetra, failure to identify and make available suitable harmonised spectrum across Europe on a timely basis has severely hindered the exploitation of Tetra technology. The key determinant is the way in which market growth will be hindered by the lack of timely availability of suitable harmonised spectrum. It is no longer commercially attractive for a single country the size of the UK to exploit a technology in a non-standard

way, and product life cycles are much shorter than previously making timely availability of spectrum more critical.

xii. The Review needs to form an opinion of whether there is more scope for independent spectrum management organisations, either on a non-commercial or commercial basis. In reviewing this situation, it would be helpful to consider what financial incentives might be appropriate for such arrangements. Under the present situation, organisations self-managing their spectrum pay the same rates as when RA undertakes the work.

xiii. It is important to allow potential users and spectrum managers greater access to data to encourage more efficient use of spectrum and rapid recycling of assignments when no longer required by the original user. To preserve confidentiality and security, access could be granted via RA who would give accredited status to bona fide enquirers against a strict set of criteria. The starting point might be those organisations who participate in the government spectrum management co-ordinating machinery, and thus already have access to privileged data, and can take advantage of this additional information to enhance the spectrum management process.

xiv. In principle this is the logical extension of the market mechanism, but it is open to question whether, in the case of finite resource such as the radio spectrum, purely commercial trading would result in speculation, exploitation and excess profits by commercial organisations to the detriment of the overall economic welfare of the nation.

It should be noted that during the passage of the 1998 Wireless Telegraphy Act, the government gave assurances to Parliament that the utilities would always have access to spectrum needed for the safe operation of their networks.

xv. A distinction between marketed and non-marketed goods is not seen as the most helpful way of distinguishing between particular uses. In the commercial arena, there is a distinction between businesses which use the spectrum to engage in telecommunications activities, eg mobile 'phone companies, and those for whom radiocommunications provides an essential element in the conduct of a non-telecommunications business, eg taxi companies.

In the public area, there are also commercial organisations who need to use radio to discharge a statutory or regulatory obligation. Air traffic control and maritime communications provide examples. In JRC's own field, the obligation on Transco to attend uncontrolled gas escapes within one hour of notification requires the use of radio communications to deliver the service in a cost effective manner in the national interest.

In the USA and Canada, and possibly other countries, a distinction is drawn between the Emergency Services (usually Police and Fire), and Commercial Services with the introduction of what are designated "Public Safety Services". These are usually deemed to be utilities and transportation, plus other similar users. It is notable that the US and Canada award sizeable chunks of spectrum to Public Safety. [Industry Canada Consultation Document <http://strategis.gc.ca/spectrum> is considering a new allocation of 24 MHz in 746-806 MHz band for public safety services.]

xvi. Although Public Safety Services should be guaranteed access to spectrum, the price should be similar to that charged to commercial users (determined by whatever means) to avoid inappropriate allocation of a scarce resource.

xviii. There should be greater scope for private users to share with the defence establishment as defence users rarely use their spectrum intensively in the time domain. Defence sharing with civil users might also deliver benefits to defence users in lower cost products deriving from increased economies of scale if more users occupy a given tranche of spectrum. There may be further benefits in the national interest since in times of crisis as military personnel support civilian personnel (eg foot and mouth epidemic and severe weather disruption of electricity infrastructure). In these cases, spectrum sharing agreements may lead to improved communication between civil and military operations.

xxi. For spectrum pricing to work, it must have an impact at the allocation level. At present, the majority of UHF spectrum is used to deliver a wideband service to fixed receivers, largely because it has always been that way. The Industry Canada example quoted above proposes to introduce the mobile service on a co-primary basis with the broadcasting service in the frequency band 746-806 MHz.

xxii. Broadcasters must pay the full opportunity cost of their spectrum, and be allowed to migrate users to alternative technologies to release spectrum where it is economically attractive so to do. The key area where broadcasters may find it attractive to offer alternative delivery options is for small relay stations where the running costs are large compared to the community served. Corresponding reductions could be considered in their Broadcasting Act or Wireless Telegraphy Act fees in exchange for the return of prime UHF spectrum where viewers have been offered equivalent delivery mechanism, eg Digital terrestrial, cable, satellite, 40 GHz MVDS, etc

xxix. Interestingly, there is already an example of where the emergency services are currently interested in sharing spectrum with other safety critical users, but to date have been prevented from doing so by government. [Approaches by utilities to share the BT Airwave network.] The dialogue is continuing since there appears to be an overwhelming case for public safety workers (Police, fire, ambulance, local authorities and utilities) to be able to share the new digital network being installed by BT Airwave for the Home Office, especially in sparsely populated parts of the UK where currently, each of the parties has their own dedicated private network which is spectrally and economically inefficient.

xxxi. Auctions may be an appropriate mechanism for the award of licences to operate public telecommunications networks, but it is difficult to see how such a process could be used to award licences directly for private users. A private user only needs access to spectrum in a geographic area defined by his business requirements, and for a period of time commensurate with the operation of that business.

By way of example, PMR for a taxi company is only needed in the area in which it operates. When such a business is launched, the spectrum is needed at that point. The company could not easily await the next auction; and if the taxi company has identified a market opportunity in Uxbridge, spectrum in Basildon is of no value to them.

xxxiii. Spectrum trading would be a major change in the way in which spectrum is managed, and would sensibly be introduced gradually. Although apparently minor in nature, allowing existing spectrum users to trade at the margins would be a valuable way of reaping quick rewards for the process whilst gaining valuable experience. Informal “trading” already takes place when RA seeks to accommodate special requirements amongst existing users. At present, the system operates through goodwill and a measure of negotiation, but no money changes hands. Developing the process with the opportunity for payments to be made would stimulate more active trading, to the national benefit.

A further area which has not been given much attention is the impact that positive marketing might have on the use of spectrum. Most major spectrum users, by the nature of the product, will not need to use the spectrum in their charge as intensively in one part of the country as another. Once trading is permitted, there will be a financial incentive to find uses for that spectrum where the licensee of the block of spectrum is not making intensive use, provided the block licensee can recoup the marginal cost.

By way of example, most national spectrum users do not use their spectrum as intensively as it could be used in Scotland and Wales. In a spectrum trading environment, managers of national blocks of spectrum would have the incentive to actively seek users and applications in remote areas.

Background

1. JRC manages just over 4 MHz of spectrum, of which 2.8 MHz is for PMR applications and 1.2 MHz for scanning telemetry and telecontrol services. JRC created and manages a national cellular plan for co-ordinating frequency allocation for some of the largest PMR networks in the UK. JRC also represents gas and electricity interests on government committees addressing radio issues.
2. JRC manages VHF and UHF allocations. These networks keep the electricity and gas industries in touch with their field engineers throughout the country. The networks provide comprehensive geographical coverage to support the installation, maintenance and repair of plant in all weather conditions.
3. JRC members’ wide area networks mostly operate within ‘JRC Band’, which falls within the Middle VHF Band spectrum. This comprises 76 channels deployed within a cellular re-use strategy involving a 9 cell cluster. Most networks use MPT1327 protocols. JRC members also have access to a separate VHF high band frequency for hand-portable use.
4. JRC members have access to 13 non-contiguous two frequency UHF1 channels at 428 MHz paired with 443 MHz. These frequencies are restricted to major conurbations, and are shared with Government Services operating outside those areas. JRC members also have access to 21 two frequency UHF2 channels at 456 MHz paired with 461 MHz.
5. The Scanning Telemetry Band comprises 2 x 1 MHz of 80 two frequency channels within the frequency range 457.5-458.5 MHz paired with 463-464 MHz. JRC was instrumental in creating and now managing the national adaptable cellular plan for co-

ordinating frequency allocation for 48 UHF channels for telemetry and telecontrol on behalf of the gas and electricity industries. 24 channels are used by the water industry and a further 8 are reserved for non-utility use. The band is used by radio based System Control and Data Acquisition (SCADA) networks which control and monitor safety critical gas and electricity industry plant and equipment throughout the country. These networks provide reliable communications to unmanned sites and plant in remote locations.

6. JRC members' microwave links reside in a variety of bands managed by RA and planned on an homogenous basis. Frequency bands used by JRC members for microwave fixed links include 1.5, 7.5, 13, 14, 22, 38 and 58 GHz bands. Additional bands have become available to replace those lost due to World Radio Conference decisions, namely the 1.4, 2.2, 24 and 55 GHz bands. JRC does not manage any fixed links bands, but supports members' applications to RA.

7. JRC also supports industry interests in automatic meter reading systems in the 183.5-184.5 MHz band managed by RA.

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