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Dear Jim

UK Defence Spectrum Management: Consultation on an Implementation Plan for Reform

Ofcom is grateful for the opportunity to comment on the MOD's consultation on its implementation plan to reform UK defence spectrum management and welcomes the MOD's initiative as an important step forward that is likely to generate substantial benefits for UK citizens and consumers.

General observations

The importance of radio spectrum and public sector spectrum management reform

Wireless services underpin a significant proportion of UK GDP and deliver important benefits to citizens and consumers. Demand is growing for spectrum to provide the advanced communications services that UK businesses, citizens and consumers require¹. At the same time, public bodies, such as the MOD, might need increasing bandwidth to maintain public safety and national security and to deliver other essential public services.

Radio spectrum is a valuable and limited resource and it is important that it is managed effectively and used efficiently by both the commercial and the public sectors. Otherwise, spectrum scarcity is increasingly likely to hold back innovation and competition and public services, which are largescale users of spectrum, will become more costly to provide.

The Government's *Forward Look* programme aims to improve spectrum efficiency by reforming the way in which the public sector manages its extensive spectrum holdings. As

¹ Evidence for this is provided by a report by Analysys Consulting Ltd on *Spectrum Demand for Non-government Services 2005-2025* for the Independent Audit of Spectrum Holdings. This may be found at http://www.spectrumbaudit.org.uk/pdf/spectrum_demand.pdf.

the independent regulator and competition authority for the communications industries, Ofcom is responsible for managing civil spectrum in the UK. Ofcom strongly supports the Government's reforms and is committed to playing a full part in their implementation. There is wide interest internationally in improving public sector spectrum efficiency and the UK is in the vanguard of reform.

Progress by the MOD

The MOD has the largest spectrum holdings of any public or private sector organisation in the UK and the proposals on which it is consulting are the cornerstone of the Government's programme. The MOD's commitment to release a significant proportion of its spectrum holdings can make a significant contribution to alleviating forecast shortages of spectrum.

Ofcom welcomes the considerable progress that the MOD has made since the publication of the Government's response to the Independent Audit. In particular, the MOD's detailed audit of its present spectrum use and future requirements is a significant achievement that will provide the essential groundwork for maximising spectrum release and sharing while ensuring that operational needs continue to be met in a cost-effective manner. Ofcom commends the MOD's example to others in the public sector.

Yet much remains to be done to deliver actual releases of spectrum to the market and the size of the task should not be underestimated. It will be necessary to complete the detailed audit, to translate the outline plan into firm and specific proposals and to implement these. We look forward to learning more of the MOD's detailed plans in the statement following this consultation and to reports of further progress by the MOD and other departments in the next *Forward Look* in spring 2009.

We note the need to secure agreement of other departments and public bodies, especially the Department for Transport, in relation to the important frequency band at 2.7-3.1 GHz. We expect that the departments and other public bodies concerned will wish to progress this matter as quickly as possible and we note that substantial effort is under way to progress this issue.

Ofcom's approach to managing spectrum

Ofcom has progressively applied market mechanisms to incentivise spectrum efficiency by commercial organisations. The MOD's present proposals, complemented by our *Spectrum Framework Review for the Public Sector* (the SFRPS), are now extending these reforms into the public sector.

Ofcom is strongly committed to putting in place the mechanisms and the regulatory framework that will allow the MOD and other public bodies to engage with the market to meet their spectrum needs and to release or share spectrum. In particular, we are currently consulting on proposals to introduce tradable Recognised Spectrum Access (RSA) in the 406.1-430 MHz band, which the MOD proposes as an initial pilot release next year, and aim

to extend this framework to other bands to support the MOD's programme and enable it to proceed.

General comments

Making more information available about future spectrum releases

We understand that the MOD is not yet in a position to quantify its spectrum release plans but it is desirable that its November statement provides more quantitative detail of the bandwidth that the MOD expects to release or share. This would have the following benefits.

- It would provide useful clarification of the MOD's plans for those interested in acquiring spectrum and help communications providers and others to plan ahead on the basis of better information about the spectrum that is likely to become available.
- It would inform European and wider international developments. Information about the MOD's plans could stimulate similar releases in other countries and help realise benefits of economies of scale or cross-border operability. There is keen interest in the EU in how to improve public sector spectrum efficiency and the European Commission has requested the Radio Spectrum Policy Group to prepare an Opinion on this subject. Ofcom is playing a prominent role in this work to raise awareness of the UK's approach.

Promoting and safeguarding competition and innovation

Ofcom believes that the MOD's proposals will boost innovation and competition. The new framework for public sector spectrum management, of which the MOD's proposals are an important part, will encourage public bodies to release their spectrum holdings to the market, creating opportunities for new market entry and increasing competition.

However, there might be potential for a company or intermediary that obtained control of a large proportion of the spectrum necessary for a particular service to behave in ways that could distort competition. Furthermore, there is scope for conflict of interest if a band manager employed by the MOD is also engaged in providing commercial wireless communications services.

We therefore welcome the MOD's acknowledgement in paragraph 6.20 of the importance of considering competition objectives and appropriately addressing any conflict of interest. It will be important to take a broad view of competition issues and ensure that spectrum release and sharing are implemented in a way that actively promotes competition. We do not suggest that the adverse consequences described above are likely as a general rule but, in line with paragraph 6.20, they should be taken into consideration by the MOD and, where appropriate, by the UK Spectrum Strategy Committee (UKSSC) and Spectrum Strategy Implementation Group (SSIG).

Bands shared with other public bodies

The MOD correctly states that progress in releasing certain bands in which other public bodies have an interest will depend on agreeing arrangements with those bodies for shared

management and decision-making. This includes the 2.7-3.1 GHz band, which represents a potentially valuable opportunity for release or sharing and could deliver substantial economic and consumer benefits.

As discussed in paragraphs 6.43 to 6.47 of our SFRPS statement of 31 January 2008, the band is currently used for aviation and maritime radar. It will be necessary to ensure that national security and public safety remain paramount in the event of sharing or release. But there could be scope for significant spectrum efficiency gains either by band sharing between radar and communications services or by re-planning radar use to make spectrum available for other applications such as mobile broadband.

Ofcom is contributing to technical studies to investigate the potential benefits. The results of initial studies into radar band sharing have been published² and, following publication of a contract notice in the Official Journal of the European Union on 10 June 2008³, we are currently in the process of selecting consultants for an initial study of radar band re-planning. The specification of this study is attached for information. It will be for the departments and public bodies concerned to take this work forward to develop and implement concrete proposals for spectrum release or sharing.

Paragraph 5.7 of the MOD's consultation states that "no proposals are made by the MOD in this document for sharing or releasing spectrum within these bands [which include 2.7-3.1 GHz], though it is an important topic on which further work is being undertaken". Ofcom agrees on the importance of the 2.7-3.1 GHz band and looks forward to working with the MOD and the other public bodies concerned (especially the Department for Transport) to bring this work to as speedy a conclusion as possible.

Bands shared with other users

As described in section 5, a wide variety of other users and uses already share the MOD's spectrum holdings. These range from commercial aviation and maritime to science, meteorology, PMSE (programme-making and special events) and Radio Amateurs. We welcome the MOD's recognition of the needs of these sectors for ongoing spectrum access and the assurances in the document that it will, in making future decisions on exploiting its spectrum holdings, give careful consideration to their requirements.

The MOD has an important role to play in meeting the Government's guarantees concerning spectrum for the London 2012 Olympic Games and Paralympic Games. We look forward to

² <http://www.spectrumbaudit.org.uk/band.htm>

³

http://ted.europa.eu/Exec?DataFlow=ShowPage.dfl&Template=TED/N_one_result_detail_curr.htm&docnumber=149359-2008&docId=149359-2008&StatLang=EN

its continued cooperation in our preparations, as outlined in paragraph 7.1 of the MOD's consultation document.

Responses to specific questions

Question 1 *Do you agree that the MOD has identified the options and factors that MOD should consider before deciding whether or not to extend the audit of the spectrum it uses?*

Question 2 *Do you have any views on the priority with which MOD should audit its spectrum use?*

Auditing current use and future requirements is a prerequisite for sound decisions on spectrum release and sharing. In view of the resource required to audit the MOD's usage, Ofcom agrees that it is sensible to carry out the work in stages. It is logical to base this phasing on prioritisation of the bands for release.

Our SFRPS statement set out our conclusions on prioritising frequency bands for release or sharing. The factors we considered should be taken into account were the needs of public sector users, demand from commercial services, current use, size of holding and international harmonisation. On that basis, we identified the bands at 406.1-430 MHz, 2.7-3.4 GHz and 3.4-3.6 GHz as priorities. We note that the MOD's audit plans are consistent with this analysis and support the MOD's broad approach.

Release or sharing in the 2.7-3.4 GHz band has particular potential to be beneficial as it lies immediately above frequencies at 2.6 GHz that are being made available on a European basis for mobile telecommunications and are in the process of being awarded throughout Europe. Release of the 2.7-3.1 GHz range in that band is complicated by its present use for aviation and maritime primary radar and it will be necessary to carry out further studies into the options for sharing or release. These are primarily matters for the MOD, Department for Transport, Civil Aviation Authority and Maritime and Coastguard Agency to take forward and decide. We urge them to give due priority to progressing this work with all possible speed so that the benefits of release or sharing may be realised as soon as possible.

Furthermore, 2.3-2.4 GHz was identified by the 2007 World Radio Conference as a new band for IMT services, which suggests that it would be beneficial to give this band high priority.

Question 3 *Do you agree with the phased approach to applying for RSA that the MOD is proposing?*

Ofcom broadly agrees with the MOD's phased approach and is tailoring its plans to make RSA and trading regulations to support it, beginning with the 406.1-430 MHz band as proposed in our Statutory Notice and consultation published on 20 June 2008. We are also very supportive of release of spectrum in the 3.4-3.6 GHz band, which is likely to be

important for the development of wireless broadband communications as reflected in the recent Decision of the Radio Spectrum Committee⁴.

As stated above in our response to questions 1 and 2, we note that Ofcom, the MOD and the other public bodies concerned have action in hand to consider the scope for releasing or sharing spectrum in the 2.7-3.4 GHz band in particular.

Question 4 *Do you agree with the MOD's plans for releasing and sharing the spectrum it uses?*

Question 5 *Do you agree with MOD's priorities for releasing and sharing spectrum?*

Ofcom welcomes the MOD's plans for spectrum release and sharing and supports its phased approach, subject to comments in previous answers on prioritisation. In particular, we agree with the advantages of holding a pilot trial in advance of the main programme. We urge other departments to follow the MOD's lead in auditing their spectrum use and to prepare detailed plans for spectrum release and sharing, including in spectrum they share with the MOD.

Question 6 *Do you agree with MOD's outline timetable for initial spectrum releases?*

Ofcom agrees with the MOD's outline timetable and looks forward to publication of further information as soon as possible, including quantification of the plans for spectrum release and sharing. We recognise that progress in certain bands, including 2.7-3.1 GHz, depends on actions by other departments and public bodies and that work is under way to achieve this. Ofcom is ready to play a full part in supporting that process while recognising that decisions that will determine the timetable are ultimately matters for the Government and other public bodies concerned.

Ofcom will continue to work with the MOD to explore other potential opportunities for spectrum release.

Question 7 *Do you agree that MOD has correctly and fully identified the factors and options that should be considered before deciding to release and acquire spectrum in the market?*

Ofcom endorses the need for the MOD to carry out an investment appraisal before making decisions on spectrum acquisition, release or sharing. We would hope that the MOD will take into account the wider economic benefits, in particular for citizens and consumers, and the desirability of promoting innovation and competition. As these broader implications could extend beyond the MOD's departmental remit, we have suggested above that they should be considered by the UKSSC and SSIG.

⁴ http://ec.europa.eu/information_society/policy/radio_spectrum/docs/in_transit/bwa/bwa_en.pdf

Question 8 *Do you agree that MOD has correctly and fully identified the factors and options that should be considered before deciding the best means with which to interact with the market?*

It is for the MOD to decide whether to employ a Third Party to assist in its spectrum release and sharing programme and to select that Third Party bearing in mind the considerations outlined in our remarks above on competition and possible conflicts of interest.

Question 9 *Can you identify any different approaches for the MOD to manage the spectrum it uses and engage with the market to deliver better value for money for defence and the taxpayer?*

Ofcom strongly supports the Government's policy that public bodies should engage directly with the market to satisfy their spectrum needs and to release or share spectrum. As noted above, we consider that any assessment of value for money should include wider economic benefits from spectrum release or sharing rather than being interpreted narrowly as being restricted to the financial impact on the MOD.

Question 10 *Which options (from paragraph 6.7) should be considered, or discounted, and if so why; either in respect of options already identified in section 6, or additional options, not identified?*

For reasons set out in our SFRPS statement, we believe that direct engagement with the market by public bodies such as the MOD is far preferable to return of spectrum to Ofcom. Direct engagement with the market is likely to:

- enhance opportunities for users to access spectrum as public bodies will have sharper incentives to release or share spectrum;
- give users a wider choice of sources of spectrum;
- accelerate innovation and promote competition by making spectrum available more quickly with resulting gains for consumers.

We further note that the Government's response to the Independent Audit and *Forward Look* programme are based on direct engagement with the market to acquire, release and share spectrum.

We would therefore discount the first option identified in paragraph 6.7 of returning spectrum to Ofcom as it would be likely in our view to result in sub-optimal outcomes. It would also be inconsistent with the *Forward Look* programme. There might be circumstances in which return to Ofcom is preferable but these are likely to be exceptional and any decision to make an exception should only be taken where justified by the evidence.

Question 11 *Which issues relating to section 6 should be considered when evaluating options, and if so why; either in respect of issues already identified in that section, or additional issues, not identified?*

Ofcom agrees that key considerations should include:

- meeting the MOD's operational needs;
- ability to secure the MOD's spectrum release objectives by:
 - effectively identifying market opportunities; and
 - facilitating trades on terms that secure optimal use of the spectrum, taking full account of the desirability of promoting economic benefits, competition and innovation;
- the relevance of competition considerations;
- avoidance of conflicts of interest.

Question 12 *Is the scope of decisions required against each of the four questions at paragraph 6.3, as indicated in section 6, sufficient and, if not, how and why it should be extended?*

Ofcom agrees that the four questions identified in paragraph 6.3 are highly pertinent and cover the main topics of interest, assuming that the fourth, on establishment, also includes selection. A possible further consideration linked to the role of the Third Party concerns how the commercial risks and rewards will be apportioned between it and the MOD.

Conclusion

Ofcom welcomes the MOD's proposals, which are an important step towards making the best use of the UK's limited and valuable spectrum resource and have the potential to deliver major benefits to society.

We appreciate the constructive working relationship we have with the MOD and look forward to continuing this as the MOD and other departments develop specific proposals for spectrum release and sharing and implement these.

Yours sincerely

Laurence Green

Specification of study into radar band re-planning

1. Background

The Chancellor's 2004 pre-budget report commissioned an independent audit of Government spectrum holdings as a corollary to the Independent Review of Spectrum Management that focused on commercial spectrum holdings. The audit concentrated on spectrum holdings below 15 GHz where it was perceived that the greatest possibility for improved spectrum utilisation through sharing existed. Professor Cave reported his findings to the Government in December 2005 with a Government response being published in March 2006.

One of the key recommendations was that there is scope for making more effective use of public sector spectrum through spectrum trading and increased sharing with other users. However there was recognition by the Government that they would need to ensure that sufficient spectrum remained available for national security, national defence and essential public services and that these services would need to be protected from harmful interference. It was also acknowledged that generic protection criteria needed to be developed in order to ensure a transparent process for the protection of public services.

The Public Sector Spectrum Test Group (PSSTG) was formed in 2004 and as a result of Independent Audit of Spectrum Holdings, agreed a specification for a test programme to be carried out on the use of bandsharing technologies to allow sharing between radars and communications systems. Its membership consists of CAA, Ofcom, MCA & MoD.

The PSSTG, have established a generic methodology by which absolute protection criteria and associated test methodologies for Government systems can be determined. Having determined the generic process and taking into account the band priorities indicated in the Cave Audit, the PSSTG have initiated the work to establish the absolute protection criteria for S band radars operating in the frequency range 2.7 – 3.4 GHz against non-radar systems.

In addition the PSSTG has been asked, as a complement to work on band sharing, to consider prospects for re-planning. In order to do so, it wishes to procure a study on behalf of its parent body, the Spectrum Strategy Implementation Group, to determine if/how the S band might be re-planned to reduce the total bandwidth that needs to be used by radar systems.

For the purposes of this Invitation to Tender, Radar refers to the following types of radar.

Maritime and VTS Radars

Air Traffic Control Radars

Military Radars

Meteorological Radars

2. Project Overview

It is intended that the project will aid the PSSTG in determining if/how the UK S-band radars can be re-planned taking into account current and foreseeable spectrum requirement to potentially allow part of the ITU-R Allocation to be shared through segmentation. It is also the intention to investigate the practical implications and associated costs of implementing such a solution.

It has been determined that the relevant resources to carry out such a project are not currently available within the CAA, MCA or MOD. Ofcom has agreed to fund an external study into the scope for radar re-planning to support the potential sharing of spectrum in the 2.7 – 3.1 GHz portion of the S band.

3. Purpose and Objective

The purpose of this study is to assist the PSSTG in determining the minimum amount of spectrum required to meet the UK's requirement for radars operating in the frequency band 2700-3100 MHz out to 2030⁵, and identify the associated practical implications and costs. The successful contractor will be expected to:

- Determine radar to radar planning criteria for the frequency band 2700-3100 MHz providing sufficient justification that will stand international scrutiny.
- Identify, using the planning criteria derived above, ITU propagation models and topographical information the minimum amount of spectrum within which the UK's current and future S-band radar requirements can be accommodated.
- Provide supporting practical evidence that the plan produced can be implemented and provides practical benefit. (e.g. a sequenced programme of frequency shifts)
- Provide information in respect of the practical implications and cost associated with implementing the proposed frequency plan.

Whilst the purpose of this work is to identify the planning criteria that can be applied to UK radars (taking full account of the International element of maritime radars in coastal waters), it is also the intention to present this information in the relevant international fora.

4. Work Items

4.1 Essential Work Items

- Consult with the main stakeholders including, but not limited to the CAA, MCA, MoD, radar operators and manufacturers.
- Determine efficient radar to radar planning criteria for the frequency band 2700-3100 MHz.
- Propose how these parameters might be modelled in a frequency planning tool, including the identification of appropriate propagation model and associated parameter settings.
- Provide evidence that the model proposed will reflect reality.
- Determine a frequency plan(s) that will practically meet current and future UK S-band radar requirements out to 2030 using the minimum amount of spectrum.
- Provide information in respect of the practical implications and cost associated with implementing the proposed frequency plan(s).
- Provide regular briefs and take part in discussions within the PSSTG on this issue

⁵ Information on future requirement will be provided

4.2 Additional Work Items

The contractor is encouraged to provide additional suggestions that will enhance the results of the project or avoid any unnecessary expenditure of effort.

5. Project Team

Given the sensitive nature of some of the information that, of necessity, members of the team will have to deal with, the potential implications for both government systems and commercial industry as well as the intended audience bids will have to demonstrate that:-

- the team has expertise in propagation, modelling, radar design, operation and testing
- the team are familiar with aeronautical and maritime use of radar in both the civil and military environments.
- information can be handled appropriate to it's level of classification
- team members are recognised as experts within their field both nationally and internationally
- capacity to provide services within the project timetable
- total costs
- team members should have no conflict of interests

6. Review Meetings

It is expected that an initial meeting would be held as soon as possible after the contract has been let and that reports will be provided to the PSSTG on a regular basis throughout the duration of the project. In addition Ofcom will on a monthly basis submit an excel spreadsheet to the project leader for completion to monitor progress.

7. Collaboration

It is left to the bidders to determine whether collaboration with other partners would be beneficial in fulfilling the requirements of the invitation to tender.

8. Deliverables

8.1 Reports and Presentation Formats

Reports should be submitted in MS Word and Presentations in PowerPoint.

8.2 Reports

A monthly summary report will be produced throughout the duration of the project timed to be available at the next suitable PSSTG meeting. The following formal reports are also required:

- **First Interim report** – within one (1) months of project start date summarising the research work to date and providing outline chapters of the final report;
- **Second Interim report** – within three (3) months of project start date summarising the research work to date;
- **Final report** – after six (6) months from start date detailing the completed work. This final report may be input into the relevant international for a.

8.3 Presentation/Demonstration

A presentation shall be made by the contractor to the PSSTG and other interested parties on the objectives and results of the study. A date for the presentation to be mutually agreed between the PSSTG and the contractor.

9. Timescales

The project shall run for 6 months (120 man days)

10. Further Information

The Audit Report, the Government Response and other material can be located at:

<http://www.spectrumentaudit.org.uk>

Further research and analysis which is potentially relevant to the study includes

<http://www.ofcom.org.uk/static/archive/ra/rahome.htm> AY4399 and AY4501

<http://www.its.bldrdoc.gov/pub/ntia-rpt/06-444/index.php>

<http://www.ofcom.org.uk/research/technology/overview/ese/sers/>