Ofcom consultation on the UK preparations for the World Radiocommunication Conference 2015 (WRC-15)

Consultation

Publication date: 27 June 2014

Closing Date for Responses: 19 September 2014

About this document

The use of radio spectrum, and its role in today's technology focused society, has never been so important. Most of us make direct use of spectrum in our everyday lives when we use mobile/smart phones, tablet computers and when we watch television (which receives signals from transmitters on the ground or from satellites that orbit the earth).

But radio spectrum is also used for many other purposes, including for aviation, maritime and by the scientific community for the detection of emissions from space (radio astronomy) or from the earth itself. This helps to inform experts of the effects of climate change and to predict major natural disasters.

All these different uses of radio spectrum benefit, to some extent, from international agreements and common arrangements concerning what bands are used by particular services. At a national level, countries have the sovereign right to plan spectrum use within their own territories. However, there are major gains from common frameworks at bilateral, regional or global levels. These common frameworks help to manage potential interference between countries and enable global communications, including for ships and aircraft. International frameworks also support common equipment specifications, which means equipment can be manufactured more cheaply, taking advantage of "economies of scale".

While bilateral and regional discussions are an on-going process, the most important of these global harmonisation activities are World Radiocommunication Conferences (WRCs). These Conferences are held approximately every four years and take key decisions concerning the identification and international harmonisation of spectrum bands.

The next WRC will take place in November 2015. Ofcom, under a Government direction, represents the UK at WRCs. This document sets out the key issues that will be considered at the conference and why they matter to the UK. It also describes the emerging UK positions on these issues.

Contents

Section 1

Executive Summary

1.1 Every four years several thousand engineers, diplomats and business executives from up to 193 countries meet for four weeks to discuss and agree a revision to the Radio Regulations (RRs). These are an international treaty setting out many diverse spectrum uses. Ofcom will lead a delegation of around 50 people made up of officials and company representatives from the UK. The outcomes from the meeting (the World Radiocommunication Conference - WRC) will set the framework for how spectrum is used over the next few years and beyond.

1.2 There are two types of WRC decisions:

- those which are inherently international (affecting satellites or the aeronautical sector) where the nature of the service means that the UK has virtually no discretion to act independently; and

- those where we have some scope left to take decisions at a national level. However, even in this case, the drive for international harmonisation to support economies of scale, as well as the need to prevent harmful cross-border interference, means that the scope for the UK to take independent decisions can be limited.

1.3 The next WRC will take place in Geneva from 2nd to the 27th November 2015 (WRC-15). It will consider a wide range of issues across a number of sector interests, including mobile broadband, maritime, aeronautical, satellite and science use of spectrum. This consultation document sets out the key issues to be discussed at the Conference, and the current UK position, as far as developed or our preliminary views on it. We also highlight the engagement process which Ofcom manages in order to allow stakeholders to meet with us and assist in the development of UK positions taken into the WRC.

1.4 This Executive Summary provides a broad overview for those relatively unfamiliar with this area. There is further detail on each of the issues in the body of the report.

1.5 Ofcom leads for the UK at WRCs and in the regional preparatory meetings. We also commit the UK to the output of the Conference by signing the Final Acts which amend the Radio Regulations (an international treaty). We do this under a direction from the UK Government. We also confirm positions we take on WRC agenda items with the UK Government, in order to ensure consistency with Government policy.

1.6 To inform the UK's position, Ofcom engages regularly with stakeholders that have an interest in WRC-15 both on an individual and multilateral basis. We aim to ensure that they are kept informed of our overall strategic approach and emerging UK views and that they are able to bring ideas and proposals into the preparatory process, to inform the UK debate. This consultation is part of this engagement and provides an opportunity to seek further views on the development of UK positions. We also hope it helps draw out linkages between agenda items which may not be apparent otherwise and are particularly interested in hearing from those stakeholders not already involved in the WRC preparatory process.

1.7 The issues discussed at WRCs are wide and varied and in many cases go into a level of technical detail that is not always easy to follow. We elaborate on this in the

main body of the document. However we would like to bring attention to the following issues which we believe are of particular interest and/or relevance to the UK:

- the future availability of spectrum for mobile broadband (including Wi-Fi)[1] with particular focus on some key bands
- the spectrum requirements of the emergency services and associated agencies for Public Protection and Disaster Relief
- spectrum requirements for the command and control of Unmanned Aircraft (UA)
- the inclusion of leap seconds in global time and its link with Greenwich Mean Time.

We provide a short summary of each of these below.

1.8 **Mobile broadband (including Wi-Fi):** One of the highest profile issues is how to address the increasing use of data by mobile devices. We have recently set out our long term strategy to address this which identified a number of bands for further work[2]. The WRC presents an opportunity to start identifying the bands that can potentially be harmonised, allowing for the lead time required for equipment to be developed and services to be rolled-out. As part of this, the European and international working groups preparing for the conference have carried out studies to assess technical compatibility with existing services in a number of frequency bands and will then make proposals for specific bands.

1.9 Ofcom is very actively engaged in these discussions at both an international and European level. We recognise that it is not always easy to project future demand for mobile broadband, and want to ensure that international decisions allow us to react to future growth in demand if and when needed.

1.10 This strand of WRC work covers several bands. One band that we expect to be the subject of debate is the **470 – 694 MHz band**. In most countries around the world this band is predominantly used for broadcast television services. This is also the case in the UK. As recently stated in our Free to View discussion document[3], we see an important role for digital terrestrial television in the UK for many years. We are monitoring developments carefully but our current expectation for WRC-15 is that we would resist a co-primary mobile allocation in this band.

1.11 Other bands worth highlighting in respect of mobile broadband are;

- **3.4 – 4.2 GHz:**

  Within the EU, part of this band (3.4 to 3.8 GHz) is subject to a European Commission Decision that makes it available for mobile broadband. Internationally, however, the band's availability for mobile broadband is fragmented, and the satellite industry places great importance on continued access to the band. This is because it has certain technical advantages

[1] WRC-15 Agenda Item 1.1 is assessing spectrum requirements for both mobile broadband and also for Wi-Fi and so where reference is made to mobile broadband this term is used to encompass both types (Wi-Fi is a trade mark of the Wi-Fi Alliance – www.wi-fi.org – Ofcom is not responsible for the content of external websites).
[2] http://stakeholders.ofcom.org.uk/consultations/mobile-data-strategy/
[3] http://stakeholders.ofcom.org.uk/consultations/700MHz/ftv/

compared to other satellite bands, particularly in tropical areas (i.e. less affected by rain effects or "rain fade" in countries where heavy regular rainfall is normal).

Ofcom supports the use of band 3.4 – 3.8 GHz for mobile broadband and this position is supported by the European WRC preparatory group within CEPT[4]. We also support the longer term consideration of 3.8 – 4.2 GHz for potential mobile broadband use in CEPT/EU. We recognise, however, the sensitivities and concerns that would be raised if there were consideration of a mobile allocation up to 4.2 GHz at WRC-15.

- **5 GHz:**

  This band could deliver additional capacity for Wi-Fi services, which we anticipate will continue to grow over the coming years. The current discussions centre on whether Wi-Fi devices can make use of a contiguous bandwidth of around 775 MHz in this band without causing harmful interference to incumbent services.

  One of the two frequency ranges under discussion is used by a European satellite network "Copernicus" which will scan the earth providing imaging data for environmental/security/disaster monitoring. The other band is used for military radar and aeronautical use. Ofcom sees merit in exploring sharing options for this band. We are conscious however that any future decision to extend the allocation for Wi-Fi at 5 GHz will need to be subject to suitable coexistence measures to protect the important incumbent services. Technical work is on-going to determine whether, and under what circumstances, sharing may be possible in this band.

1.12 In addition, there will be a discussion on the use of the **700 MHz band** (i.e. 694 – 790 MHz) for mobile broadband. The last WRC in 2012 agreed to a co-primary mobile allocation for the 700 MHz band subject to the necessary technical studies. A final decision will be taken at WRC-15. The UK supports the change and we see the benefits this brings to support the further development of mobile broadband at international level, as explained in our UHF strategy statement[5]. The main issue internationally has been over which band plan to use. We have supported the 2 x 30 MHz plan which is aligned with that already adopted in Asia Pacific, and this has recently been endorsed by the rest of Europe. We also want to ensure the continued protection of adjacent Digital Terrestrial Television platform use of channel 48[6].

1.13 A final element of the debate about future spectrum requirements for mobile broadband relates to higher frequency spectrum. This will not be decided at WRC-15 as the scope of the mobile broadband agenda item has been limited to spectrum bands up to around 6 GHz. However, it is expected that WRC-15 will consider a proposal for a **future agenda item** for the next WRC in 2018 or 2019 which will specifically look at additional spectrum requirements for mobile above 6 GHz. If this is agreed, a contentious issue at WRC-15 will be to determine the scope and focus of this future agenda item.

[4] European Conference of Postal and Telecommunications Administrations http://www.cept.org/ecc
[5] Securing long term benefits from scarce spectrum resources – A strategy for UHF bands IV and V, http://stakeholders.ofcom.org.uk/consultations/uhf-strategy
[6] Digital Television channel 48 is centred upon 690 MHz.

1.14 **Public Protection and Disaster Relief (PPDR):** This will look at the spectrum used for emergency and disaster relief communications, including the provision of a spectrum database to assist with the choice of operational or inter-operational assistance during cross border incidents. Ofcom is working with the UK emergency services and related agencies. We support a model that enables the UK, at a national level, to identify a range of different frequency bands, which includes the potential use of established commercial networks. We oppose a solution based purely on dedicated and explicitly identified PPDR frequency bands.

1.15 **Unmanned Aircraft (UA) use of the fixed-satellite service bands:** WRC-15 will consider whether fixed-satellite service (FSS) frequency allocations could be used for the command and control of unmanned aircraft. This is linked to the regulatory considerations for aviation more generally (over which Ofcom has no responsibility), and raises safety of life issues. We believe we should take a cautious approach, particularly noting that the evidence (from the international aviation organisation) to assess whether FSS allocations can be used for UA command and control is currently lacking.

1.16 **Coordinated Universal Time:** WRC-15 will take a decision on whether the inclusion of the leap second into Coordinated Universal Time (UTC) should continue. There are two ways to measure time: astronomical and atomic. Some administrations[7] favour atomic time due to its greater stability and accuracy and argue that the insertion of leap seconds can cause operational difficulties for a range of electronic systems. The UK believes that the problems associated with the insertion of leap seconds are relatively minor and can be overcome through appropriate preparations in advance of insertion. The UK therefore currently supports maintaining the leap second in UTC.

1.17 We explore these and many other issues in more detail in the rest of the document. We are keen to hear from all stakeholders with an interest in any of the issues to be discussed at the next WRC. This consultation complements our programme of on-going stakeholder engagement, which includes active discussions with stakeholders in dedicated working groups, roundtables, workshops and bilateral meetings. In the next section, we set out further detail on our approach to stakeholder engagement.

1.18 The closing date for responses is 19th September 2014. We will consider these as we refine the UK line, bearing in mind that the final UK positions will only be adopted a few weeks before the Conference. We will of course continue to actively engage with all stakeholders in the run-up to the conference.

[7] Administration(s): term used to indicate a country's governmental department or organisation representative, that is able discharge a countries obligations/activities in the International Telecommunications Union (ITU).

Section 2

Introduction

The Radio Regulations and why they matter

2.1 The international framework for the management of the radio frequency spectrum is documented in the International Radio Regulations (RRs)[8] as published and maintained by the International Telecommunication Union (a specialised agency of the United Nations). These have the status of an international treaty and determine the rights and obligations, placed upon national administrations, around the use of spectrum in their country relative to spectrum use in all other countries. Alongside this the RRs also recognise the sovereign right of countries to manage and use spectrum, within their borders, the way they wish to without causing interference to other countries use. The RRs are produced and updated by a World Radiocommunication Conference (WRC), which is held approximately every four years, inviting participants from 193 countries.

2.2 The RRs contain a table of frequency allocations which subdivides the radio spectrum from 8.3 kHz to 275 GHz into a large number of frequency bands, each being allocated to one or more defined radiocommunication services (such as broadcasting, mobile, fixed and various space services).

2.3 The RRs also contain regulatory procedures for coordinating frequency use between countries at the level of individual assignments, i.e. individual stations or networks. Such procedures establish rights and obligations, giving the regulatory certainty necessary for investment in radiocommunication systems. For example, the right to operate frequencies on a satellite cannot be defined simply on the basis of the operation from the territory of one country and a complex set of procedures is in place for notification and co-ordination of frequency assignments to ensure equitable access to this valuable spectrum/orbital resource. Other provisions may be specific to certain radio services, including pre-determined frequency assignment plans in some cases, and detailed operational procedures (particularly for maritime and aeronautical services).

2.4 For the purposes of spectrum allocations, the RRs divide the world into three broad geographical Regions: Region 1 covers Africa, Europe (including Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine) and the Middle East; Region 2 covers the Americas; and Region 3 covers the Asia-Pacific countries. Although there is a good degree of alignment between the Regions, there are also distinct differences in many important parts of the spectrum.

2.5 The RRs have, for many years, determined the pattern of spectrum use for almost the entire radio spectrum and almost all radio services. In many cases, it is necessary to do this at international level in order to:

- Avoid or keep cross-border interference to a minimum;
- Facilitate mobility and interoperability of radio equipment (especially important for terminal equipment such as mobile phones);

[8] http://www.itu.int/pub/R-REG-RR/en

- Derive benefits from international markets for equipment with resulting economies of scale for operators and users; and

- Recognise the international nature of some radio services (for example, aeronautical, maritime and satellite services all require spectrum to be available seamlessly across national boundaries).

UK preparation for WRC-15

2.6 There has not been a comprehensive revision of the RRs since 1979. All subsequent WRCs have undertaken a partial revision of the Regulations on the basis of a fixed, pre-determined agenda prepared at the previous WRC, before being formally endorsed by the Council[9] of the ITU.

2.7 The agenda for WRC-15 was drafted and provisionally agreed at WRC-07. It was then confirmed at WRC-12, after necessary changes[10]. This is normal practice and allows for changes between WRCs as some items may no longer be seen as valid and may be removed from the agenda of a later WRC. The organisation of work between WRCs, including the attribution of the work to the appropriate ITU-R Study Groups, is decided at the first Conference Preparatory Meeting (CPM) held during the week immediately following the previous WRC.

2.8 Proposals to WRCs are usually co-ordinated by countries through the regional groups. In the case of the UK, this is within the European Conference of Postal and Telecommunications Administrations (CEPT). CEPT, which currently has 48 member countries, submits European Common Proposals (ECPs) to the WRC. Each CEPT member is free to formally sign each ECP and, unless there is good and justified reason not to do so, the UK would usually support all the ECPs developed through this process.

2.9 Ofcom is responsible for the development of the UK positions taken into both the CEPT process and then on to the conference itself. At the most formal level we agree the positions and negotiating lines we take into the WRC through the Government's UK Spectrum Strategy Committee (UKSSC) in order to ensure consistency with Government policy. Ofcom chairs the International Frequency Policy Group (IFPG), which is a sub group of the UKSSC and provides a forum for Ofcom, Government, its Agencies and relevant statutory regulators to meet and discuss the developing positions. Thus the IFPG acts as a sounding board between Ofcom and Government, enabling Ofcom to ensure that key UK positions and associated negotiating strategies are aligned with Government priorities. The core UK positions, however, are developed through four working groups that include stakeholder representatives (see detail below).

2.10 As well as leading for the UK in the European process, Ofcom also monitors developments at the global level and, where justified, participates as an observer in relevant meetings outside Europe including CITEL (Americas); APG (Asia-Pacific); ASMG (Arab group); RCC (former Soviet countries) and ATU (Africa).

[9] ITU Council Resolution 1343 (July 2012)
[10] A full list of the agenda items and the directly related Resolutions, for WRC-15, is available on the ITU website http://www.itu.int/oth/R1201000001/en

Ofcom's engagement with UK stakeholders

2.11 Ofcom is keen to ensure that the development of UK positions for WRCs takes into account the views and concerns of all UK stakeholders. To this end, we engage regularly with industry and others, both bilaterally and on a multilateral basis. We have set up four separate working groups[11] that are open to all stakeholders who have a relevant interest in international spectrum matters. These Working Groups allow for an open debate to help inform the development of UK positions on individual issues which can then be taken forward into the European (CEPT) and International (ITU) discussions. In addition, the International Spectrum Stakeholder Briefing group (ISSB) is a high-level forum which provides an opportunity for Ofcom to engage with stakeholders at a strategic level across all of our international spectrum-related activities (including the WRC).

2.12 For each of the WRC-15 Agenda Items, we have appointed a UK co-ordinator. They are primarily responsible for reviewing the technical work, and for seeking stakeholder input through a combination of face-to-face meetings, correspondence and participation in the relevant working group. The UK coordinator is identified at the end of the discussion of each agenda item in this consultation document and a full list of UK coordinators is shown in Annex 7.

2.13 In many cases the UK co-ordinator, assisted by the participants of the relevant working group, will develop positions which are supported by UK stakeholders. In some cases, however, this may not be possible and for the most contentious or difficult items Ofcom may ask UKSSC to develop the UK position. In all cases, Ofcom will endeavour to communicate openly and clearly to stakeholders the rationale for the UK position and how we have considered and balanced the various concerns that have been raised.

Purpose of this consultation

2.14 This consultation aims to inform users of the radio spectrum of the issues that will be discussed at WRC-15, and the current UK position or our preliminary views on it. We invite interested parties to identify their priorities for the conference, share any concerns relating to individual agenda items and comment on our overall strategy and process of engagement. We are particularly interested in the views of those stakeholders that are not active in the formal preparatory process. For details of how to respond to this consultation see Annex 1.

[11] Working Group A - Scientific and Regulatory, Working Group B – Satellite, Working Group C - Aeronautical, Maritime and Amateur, Working Group D - Mobile and Mobile Broadband.

Section 3

The WRC-15 agenda: general overview

3.1 The agenda for WRC-15 contains over 20 agenda items covering many frequency bands and radio services and includes "standing" agenda items which address general regulatory and procedural matters. Some items are very specific and tightly defined while others cover a wide range of issues. All have the potential to create new opportunities for the use of the radio spectrum and may therefore present a threat to existing users.

3.2 There will be varying levels of interest across the agenda items. Internationally, the level of interest will be predominantly driven by differing national policies, regional agreements and industrial interests related to the nature of the issue and the frequency band, or bands, under consideration.

3.3 For the purposes of this consultation, we have grouped the various agenda items into the following broad subject categories (these do not have any formal international recognition):

- **Electronic Communications Services**: This covers spectrum allocations to communications systems that would predominantly deliver services to end users. This includes high profile issues that have a significant citizen and consumer interest such as future spectrum for wireless broadband to support devices such as smartphones, tablet computers and associated consumer devices. Although the focus of attention is often on terrestrial wireless broadband, issues covered in this section also include a number of satellite related agenda items. We have also included agenda items covering Public Protection and Disaster Relief and the amateur service in this section.

  Two issues are likely to attract most attention: the identification of future spectrum bands for wireless broadband (Agenda Item 1.1) and a resolution that is expected to result in the TV broadcast band at 700 MHz[12] formally being harmonised for mobile broadband use (Agenda Item 1.2)[13]. Given the considerable interest in Agenda Items 1.1 and 1.2, Ofcom published a separate Call for Input[14] in March 2013 and has also consulted separately on specific frequency bands of interest in our Mobile Data Strategy[15]. The responses to the Call for Input and the Mobile Data Strategy Consultation have helped inform this consultation document. It is worth emphasising that, although Agenda item 1.1 is focused on wireless broadband, a number of other services could potentially be impacted by any decision to allocate additional spectrum to the mobile service.

Relevant agenda items: 1.1, 1.2, 1.3, 1.4, 1.6 (1.6.1 and 1.6.2), 1.7, 1.9 (1.9.1), 1.10

- **Transport, including radiodetermination**: This covers spectrum use by transport related applications. Many of these agenda items are of particular

[12] The 700 MHz band refers to 694 – 790 MHz
[13] The provisional identification of a co-mobile allocation, and IMT identification, in the 700 MHz band was agreed at WRC-12.
[14] http://stakeholders.ofcom.org.uk/consultations/cfi-mobile-bb/
[15] http://stakeholders.ofcom.org.uk/consultations/mobile-data-strategy/

interest to the aviation and maritime sectors and the associated regulatory bodies in the UK (i.e. the Civil Aviation Authority, the Maritime and Coastguard Agency and the Department of Transport). Following WRC-15, we expect that these bodies will need to consider developing additional regulatory and implementation measures. These measures might include notices or regulations which place certain requirements on aviation or maritime, whether UK based or for those coming into UK airspace or UK waters. Moreover these UK authorities are active in European[16] and International[17] bodies that have wider responsibility for aviation and maritime measures. These links play an important part in the formulation of the UK position.

Relevant agenda items: 1.5, 1.8, 1.9 (1.9.2), 1.15, 1.16, 1.17, 1.18

- **Scientific use of spectrum**: Issues considered within this section include:
    - Radio astronomy which is the detection of naturally occurring radio emissions in space.
    - Earth Exploration Satellite Service which is the use of radio spectrum for the purposes of mapping and imaging of the earth's surface. This data is for example used to assess the impact of environmental change on the earth.

Relevant agenda items: 1.11, 1.12, 1.13, 1.14

- **Standing agenda items**: These are agenda items discussed at each Conference to make general regulatory changes to the Radio Regulations. One of these is the consideration of the Director's Report (Director of the ITU Radiocommunication Bureau) to WRC-15 which will evaluate developments in the Radiocommunication Sector since WRC-12.

Relevant agenda items: 2, 3, 4, 5, 6, 7, 8, 9 (and sub issues thereof)

- **Future Agenda items**: Every WRC considers the agenda for the next conference and the conference subsequent to that. These proposals can appear right up to and during the WRC itself. The UK has made a specific proposal to consider mobile broadband in frequency bands above 6 GHz.

Relevant agenda items: 10

3.4 The remaining sections of this document are structured around each of these categories. Each section provides a summary overview of the individual agenda items in a format suitable for those who are not already familiar with the WRC process. We also set out the UK objectives, based on existing Ofcom policies, previous consultations, and discussions with UK stakeholders. Finally, we have sought to identify any linkages between issues which may not be immediately obvious from the WRC agenda itself.

[16] The European Organisation for the Safety of Air Navigation (EUROCONTROL) whose objective is the development of a seamless, pan-European Air Traffic Management (ATM) system.
[17] International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), which are specialised agencies of the United Nations.

3.5 Given the lead time to the conference, we expect to review our objectives and positions continuously as the technical preparatory work progresses. We see this consultation as an important step in this process.

3.6 The consultation also identifies what we consider to be the relative priorities of the various agenda items. We have prioritised these as follows:

- **High**: key policy issues for the UK, either because of their strategic importance or because of the potential threat they may pose to UK interests. This will usually apply where there is a major conflict between radio services or between differing UK interests, and especially where the agenda item is so wide-ranging that it presents potentially multiple, as yet undefined, threats (e.g. where additional spectrum is sought without any indication as to the target band). We anticipate these to be controversial with diverging views from other countries, including within Europe. We will aim to actively engage at all stages.

- **Medium**: important for the UK and/or likely to present some difficulties, at least in detail. This will generally apply to agenda items mainly confined to a single radio service, rather than where this is a major conflict between services. We expect some degree of consensus at least in Europe but will ensure UK participation in all relevant meetings.

- **Low**: either relatively unimportant for the UK or sufficiently straightforward and uncontroversial that we can expect others to lead with minimum risk to the UK. We will however continue to monitor developments.

3.7 As a rule, we will devote more resources to our high priorities but will keep this prioritisation under review. Even for low priority items, proposals could be made that require a more proactive involvement as a result.

3.8 A list of all the agenda items and the priority we have provisionally assigned to them is set out in Annex 6. The prioritisation has been undertaken in collaboration with Government departments and other interested stakeholders and we would welcome views as to whether we have identified the priorities correctly. We will take account of responses to this consultation in prioritising the work going forward.

Question 1: Do you have any comments on the mechanism for UK preparation for WRC-15 and the role of Ofcom in this process?

Question 2: Do you agree with the prioritisation of the agenda items, as shown in Annex 6, and if not why?

Section 4

Electronic Communications Services

4.1 This section addresses the following WRC-15 agenda items:

1.1	Additional allocations for Mobile (IMT[18]) services and applications
1.2	Mobile allocation in the frequency band; 694 – 790 MHz
1.3	Broadband Public Protection and Disaster Relief
1.4	Amateur service, on a secondary basis, in the 5 250 – 5 450 kHz band
1.6	Additional fixed satellite allocations between 10 and 17 GHz
1.9 (1.9.1)	Additional fixed satellite allocations in the 7 and 8 GHz bands
1.10	Additional mobile satellite IMT allocations in the 22 – 26 GHz range

Agenda Item 1.1 - Additional allocations for Mobile (IMT) services and applications

4.2 Agenda item 1.1 addresses additional spectrum allocations for mobile services that would be used by IMT[19] and other terrestrial mobile broadband applications (e.g. smartphones, tablet computers, Wi-Fi services). The proposal is to increase, at an international level, the spectrum allocations available for mobile broadband services. This agenda item has had the highest profile in the lead up to WRC-15, not least as it potentially affects many of the other radiocommunication services.

4.3 The aim of this agenda item is to plan for the spectrum needed to respond to growing demand for mobile broadband, and to ensure that the options for harmonised spectrum allocations for this purpose are available to nations across the next decade. It is necessarily forward looking and considers spectrum that could be suitable for new mobile allocations and/or identification for IMT. To this end, it requires ITU-R to study potential candidate frequency bands, taking into account the results of the studies on future spectrum requirements for IMT, protection of existing services and the need for harmonization.

4.4 We believe that there is a need for sufficient spectrum to be allocated to mobile and/or identified for IMT at the international level to give us the flexibility at national level to decide when and where to release harmonised spectrum for mobile broadband as we believe there is a risk that the spectrum currently available for mobile use may not be sufficient to meet future demand. Given the long lead time needed to change the use of spectrum, our preliminary conclusion is that additional mobile allocations and/or identification of bands for IMT at WRC-15 will be beneficial. We will keep this situation under review and will continue to develop our view of future growth in mobile data demand and potential spectrum implications, recognising the degree of uncertainty associated with such analysis.

[18] IMT - International Mobile Telecommunications. The ITU term that encompasses 3G, 4G and 5G wireless broadband systems

[19] International Mobile Telecommunications is a term used to describe a suite of technologies, which are predominantly used for the delivery of wireless broadband services to users. These technologies are captured in two documents: Recommendation ITU-R M.1457 (http://www.itu.int/rec/R-REC-M.1457/en) and Recommendation ITU-R M.2012 (http://www.itu.int/rec/R-REC-M.2012/en), which are produced and maintained by the ITU.

4.5 Ofcom issued a Call for Input[20] (CFI) in relation to this agenda item in March 2013 and the results of this were used to inform our view in taking our position forward in international discussions. This was followed in November 2013 by our Mobile Data Strategy consultation[21] which set out actions Ofcom could undertake to facilitate the continued long term growth in consumer and citizen benefits from increasing use of mobile data services. We have recently published a statement on the Mobile Data Strategy which identifies a number of spectrum bands where we think further work should be carried out to consider their potential future availability for mobile data use, whilst recognising the many other competing demands for spectrum. It also sets out priorities for our international position on specific potential candidate frequency bands that are being considered under this agenda item.

4.6 The CEPT view is that additional spectrum for mobile broadband needs to be identified at the WRC level and it puts the total requirement (including current spectrum allocations) between 1340 MHz and 1960 MHz, depending on assumptions about market growth and with some national variations. We are therefore broadly aligned with the view that additional spectrum is likely to be required for mobile broadband. The CEPT view on frequency bands has been developing and more recently CEPT have updated their view on the frequency bands for consideration by WRC-15. **Table 1** shows the CEPT view on potential candidate frequency bands for consideration by WRC-15, at the date of publication of this consultation.

Table 1: CEPT views on potential candidate frequency bands[22]

The following bands are supported	The following bands are subject to further consideration taking into account sharing and compatibility studies	The following bands are not supported for mobile broadband:
1427-1452 MHz 1452-1492 MHz 3400-3600 MHz 3600-3800 MHz	470 – 694 MHz 1350-1375 MHz 1375-1400 MHz 1492-1518 MHz *3800-4200 MHz* 5725-5850 MHz 5925-6425 MHz	1300-1350 MHz 1518-1525 MHz 1695-1710 MHz 2025-2110 MHz 2200-2290 MHz 2700-2900 MHz 2900-3100 MHz 3300-3400 MHz *3800-4200 MHz* 4400-5000 MHz

Notes to the table:
3800 – 4200 MHz: is listed twice due to diverging CEPT views, and will be subject to further discussions
5350 – 5470 MHz: does not appear in any list due to on-going technical work that is yet to determine into which list it should be placed. A number of CEPT administrations have serious concerns about the feasibility of sharing between

[20] Future demand for mobile broadband spectrum and consideration of potential candidate bands http://stakeholders.ofcom.org.uk/consultations/cfi-mobile-bb/
[21] http://stakeholders.ofcom.org.uk/consultations/mobile-data-strategy/
[22] Source: Draft CEPT brief on WRC-15 agenda item 1.1, March 2014

RLANs and other applications in this band and are currently opposed to changes in this band. However, studies are on-going and the UK is contributing to these.

4.7 We have been participating in the recent CEPT discussions and agree with the potential candidate frequency bands that are currently being put forward by CEPT as "supported". We do however consider that further work is required in relation to a number of the other bands, particularly for some of those bands that are now qualified as "not supported". In respect of the individual bands;

- The 1 427 – 1 452 MHz band is managed by the Ministry of Defence (MOD) who has conducted technical work to investigate the possibility of sharing this band. Their results indicate that Defence may be able to share with other services, where those services are subject to specific technical conditions as defined by MOD[23].

- The 1 452 – 1 492 MHz band was awarded in the UK by auction in 2008. In CEPT it has been the subject of harmonisation through ECC Decision (13)03[24] for supplemental downlink, which is a mobile broadband application.

- CEPT is focussing further investigation on the 1 492 – 1 518 MHz band, looking at whether it would be possible to support it as a potential candidate frequency band, possibly in conjunction with downgrading the 1350-1400 MHz band to "not supported". The combination of the 1 427-1 452 MHz, 1 452 – 1 492 MHz and 1 492 – 1 518 MHz bands potentially creates a contiguous 91 MHz band for mobile broadband using the agreed common technical parameters detailed in the international process, which could be very attractive for the international equipment market. Should an international identification of the 1 492 – 1 518 MHz band be made for IMT at WRC-15, it would still require a decision at a national level as to whether or not the spectrum will be made available in the UK for IMT. The UK currently has a large number of fixed links in the 1 492 – 1 517 MHz band (paired with 1 350 – 1 375 MHz) supporting a range of applications, so if the band were to be supported at CEPT level, we would need to be satisfied that there was sufficient flexibility to consider further at the national level and that existing use of the band was taken into account.

- The 3 400 – 3 600 MHz band is currently planned for release (as part of the public sector spectrum release programme[25]).

- Part of the 3 600 – 3 800 MHz band has also been made available and is being brought into use for mobile broadband, and together with the 3 400 - 3 600 MHz spectrum is also the subject of harmonisation at CEPT (ECC Decision (11)06) and EU level (Commission Decision 2008/411/EC).

- The 3 800 – 4 200 MHz band remains under discussion in CEPT. Some countries are of the view that CEPT should take a firm line in opposing this band, which would automatically lead to a "no change" proposal to WRC-15, while others consider it is worth further consideration. As we have indicated in the Mobile Data Strategy statement, we will be taking action to analyse the feasibility and costs of mobile broadband sharing with Earth stations across 3.6 - 4.2 GHz at a national level, while internationally we support the longer term consideration of this band for potential mobile broadband use in CEPT/EU. Taking account of the position of

[23] https://www.gov.uk/sharing-defence-spectrum
[24] http://www.erodocdb.dk/Docs/doc98/official/Word/ECCDEC1303.DOCX
[25] http://stakeholders.ofcom.org.uk/consultations/2.3-3.4-ghz/

other countries, the line we have adopted in CEPT is that the band is not suitable for inclusion in the list of supported bands for WRC-15, but equally a firm European Common Proposal for "no change" in this band would send the wrong signal about our views on actions after WRC-15. Consequently, we believe that it should be placed in the "under study" category.

- The 2 700 - 2 900 MHz band is included in the set of bands that Government has prioritised for potential spectrum release[26]. However, it is clear that there is currently significant international opposition to this band being considered at WRC-15. This is primarily due the varying levels of radar use in the band around the world. Nonetheless, the UK will continue to monitor developments and seek opportunities to promote this band in international discussions.

- The 5 350 - 5 470 MHz and 5 725 - 5 925 MHz bands could provide additional capacity for Wi-Fi and similar systems, in particular enabling the use of much wider bandwidth channels than today, which could provide significantly higher throughput. This 5 GHz band is shared between a number of military and civilian users, including aeronautical and weather radar, earth exploration satellite services (EESS) and fixed satellite services (FSS). These users are spread over the whole of the 5GHz band, including within the current and potential future allocations for Wi-Fi. Any future decision to extend the allocation for Wi-Fi at 5GHz will need to be taken internationally, given the importance of harmonisation to the international Wi-Fi equipment market, and will be subject to coexistence measures to protect the important incumbent services. Technical work is on-going to determine whether, and under what circumstances, sharing may be possible in the proposed extension bands at 5GHz.

- The 5 925 – 6 425 MHz band is being promoted by the Russian Federation as having the potential for sharing between low power indoor mobile broadband systems and existing uses in the fixed-satellite service, based on agreed common technical parameters detailed in the international process. So far however the mobile and RLAN industries have not indicated specific interest in this band. Within the UK the band is used by fixed links and satellite Earth stations. If studies showed sharing in this band to be significantly easier to manage than other nearby bands, there might be greater support from administrations to identify this band as suitable for either IMT or RLAN use, in preference to other bands. It would therefore be helpful to receive feedback from industry to understand broader views on the band and its potential use for mobile applications if it were identified for IMT or RLAN as a substitute for one of the other candidate bands in the 5 GHz range. Our position on this band would also need to take into account whether there is any potential for sharing with the incumbent space and fixed services.

- One important band mentioned above is 470 - 694 MHz. In May, Ofcom published a discussion document on the future of Free to View television which explains our expectation that Digital Terrestrial Television (DTT) will remain important for many years in the UK. In addition, we consider that barriers associated with alternate broadcast delivery platforms such as satellite and Internet Protocol Television (IPTV[27]) make a DTT switch-off scenario credible

[26] https://www.gov.uk/government/publications/enabling-uk-growth-releasing-public-spectrum-update-on-progress-to-december-2011

[27] Internet Protocol Television -The term used for television and/or video signals that are delivered to subscribers or viewers using Internet Protocol (IP).

only after 2030[28]. This is consistent with the view we set out in our UHF Strategy Statement that we published in November 2012[29] which forms the basis of our position for international engagement. Taking these important points into consideration, we propose that, for WRC-15, the UK should oppose proposals for a co-primary mobile allocation in the 470 – 694 MHz band. We propose to take this position into the international process, in the first instance through CEPT.

4.8 If you would like to discuss this agenda item in more detail, Steve Green is co-ordinating the UK views and can be contacted by e-mail: Steve.Green@ofcom.org.uk

Question 3: Do you agree with Ofcom's general approach on WRC-15 agenda item 1.1?

Question 4: In view of the recent developments on the 1 492 - 1 518 MHz and 5 925 - 6 425 MHz bands, what are your views on the potential identification of these bands for IMT and/or RLAN and on the mobile data applications that could make use of them? How do you believe the sharing with the fixed service and the fixed satellite services could be managed at the national level?

Question 5: For the band 1 427 – 1 452 MHz, do you agree that it is right to support the further consideration of this band, recognising the Ministry of Defence interest?

Question 6: For the band 1 452 – 1 492 MHz, which is already subject to a harmonisation measure within CEPT, do you agree that this band be supported for an IMT identification at WRC-15?

Question 7: Recognising the UK plans to release spectrum in the 3 400 – 3 600 MHz band, coupled with the binding European Commission Decision (for electronic communications services) in the bands 3 400 – 3 600 MHz and 3 600 – 3800 MHz, do you agree that these bands should be supported for both a co-primary mobile allocation and IMT identification?

Question 8: Noting that there are a number of countries that strongly oppose the inclusion of the 3 800 – 4 200 MHz band, do you agree that we should support the longer term consideration of this band for potential mobile broadband use?

Question 9: Noting that there is currently limited international support for a co-primary mobile allocation in the band 2 700 – 2 900 MHz, do you think that we should continue to support this band at WRC-15?

Question 10: Do you agree that the 5 350 – 5 470 MHz and 5 725 – 5 925 MHz bands could provide important additional capacity for Wi-Fi and similar systems? If so, and noting the need to protect both earth observation satellites and radar systems, do you agree that sharing solutions should be considered at WRC-15?

Question 11: Do you agree that we should oppose a co-primary mobile allocation at WRC-15 for the band 470 – 694 MHz?

[28] We explain these potential barriers in more detail in our Free to View discussion document; http://stakeholders.ofcom.org.uk/consultations/700MHz/ftv/

[29] http://stakeholders.ofcom.org.uk/consultations/uhf-strategy/statement/

Agenda Item 1.2 - Mobile allocation in the frequency band; 694-790 MHz

4.9 This agenda item is a consequence of the WRC-12 decision on the introduction of a mobile allocation and IMT identification in 694 - 790 MHz, effective immediately after WRC-15. Its primary focus is on adjacent band compatibility between mobile and digital terrestrial television (DTT), and on the band plan for IMT use in ITU-R Region 1 (Europe, the Middle East and Africa). This band is part of the 470 - 790 MHz spectrum which is used for DTT and for programme making and special events (PMSE) in the UK and the rest of Europe. There are linkages between this agenda item and the agenda item addressing mobile broadband more generally.

4.10 The 694 - 790 MHz mobile allocation has the potential to further the interests of citizens and consumers' by increasing the available spectrum for mobile broadband services.

4.11 Ofcom consulted[30] on a strategy for the UHF broadcasting band in 2012. Our conclusions were that we should:

- Support the international process and seek to enable a harmonised release of additional low frequency spectrum for mobile broadband; and
- Seek to ensure that the DTT platform can access alternative frequencies assuming that some of its spectrum will be reallocated for mobile use. This approach will also support services sharing spectrum with DTT, including wireless microphone links.

4.12 An additional aspect of the agenda item was to consider possible refinement of the lower edge of the allocation, i.e. the 694 MHz boundary. CEPT and the ITU group that coordinates the international activities (JTG 4-5-6-7) have both confirmed that the boundary should be set at 694 MHz.

4.13 The band plan for IMT use of 694 - 790 MHz in ITU Region 1 has also been the subject of intensive discussions in CEPT and ITU-R. CEPT has recently agreed on a 2x30 MHz arrangement, utilising the lower two thirds of 3GPP band 28[31]. This band plan was originally developed as a 2x45 MHz band plan for the Asia-Pacific region and it has subsequently been adopted in Latin America and is being seriously considered in the Middle East and Africa. It would not be possible to utilise the full 2x45 MHz in Europe because the top 12 MHz overlaps with the 800 MHz band. However, a European implementation of the lower 2x30 MHz would be usable by all mobile terminals that incorporate 3GPP band 28, making this the only near-global sub-1 GHz LTE band (with the exception of the USA, which already has LTE networks on a different band plan, Canada and China, which will also use different 700 MHz band plans).

4.14 CEPT has also agreed that the band plan should include four 5 MHz blocks for supplemental downlink in the centre gap of the 2x30 MHz band plan. In addition, there are national options for implementation of PMSE or broadband emergency services communications (PPDR). The decision on which of these should be authorised in this spectrum is outside the scope of agenda item 1.2 and is likely to be decided on a national basis. The European band plan for IMT will need to be

[30] Securing long term benefits from scarce spectrum resources – A strategy for UHF bands IV and V, http://stakeholders.ofcom.org.uk/consultations/uhf-strategy

[31] 3GPP Band 28 is 703 – 748 MHz (uplink/user terminal to base station) paired with 758 – 803 MHz (downlink/base station to user terminal)

included in an update to Recommendation ITU-R M.1036, which contains all IMT band plans. This work will be carried out by ITU-R Working Party 5D.

4.15 On the matter of adjacent band compatibility with DTT, CEPT has agreed on an emission limit of −42dBm/(8 MHz) in the spectrum below 694 MHz, for 10 MHz bandwidth LTE terminals. This value is based on the requirement to manage the risk of interference between mobile use and the broadcasting service below 694 MHz, to be technically feasible for practical implementation of IMT terminals, and to achieve global harmonization of mobile terminals. The new out-of-band emission limit will need to be incorporated into the 3GPP band 28 specifications and in addition CEPT will propose that it should be written into an ITU-R Recommendation. Terminal vendors have indicated that it is feasible to include this limit in a common implementation with Asia-Pacific band 28 terminals.

4.16 The other aspect of agenda item 1.2 that concerns CEPT is studies on compatibility between the aeronautical radionavigation service (ARNS) and the mobile service. This is not an issue that the UK is directly affected by as ARNS, in the 700 MHz band, is limited to countries such as Russia and some Eastern European states and consequently the UK is outside any 700 MHz ARNS coordination zones.

4.17 The UK supports the current CEPT position. We expect the primary mobile allocation in the band 694-790 MHz to be formally confirmed at WRC-15, and the band plan and emission limits to be included in ITU-R Recommendations before the conference. These aspects are also being included in a draft CEPT Report to the European Commission, with the final report scheduled for November 2014. Ofcom has recently published a consultation[32] related to the future use of the 700MHz band.

4.18 If you would like to discuss this agenda item in more detail, Steve Green is co-ordinating the UK views and can be contacted by e-mail: Steve.Green@ofcom.org.uk

Question 12: Do you agree that the UK should continue to support harmonisation of 694-790 MHz for mobile broadband and an out-of-band emission limit for protection of DTT reception in an ITU-R Recommendation, alongside an acknowledgement that 694 MHz should be the lower frequency boundary for the band?

Agenda Item 1.3 - Broadband Public Protection and Disaster Relief (BPPDR)

4.19 This agenda item concerns the review and possible revision of an ITU Resolution which documents the scope and regulatory context of Public Protection and Disaster Relief (PPDR) internationally (Resolution 646 (Rev.WRC-12)[33]). This resolution gives particular focus to future broadband PPDR services. It also gives a broad understanding of what PPDR is and additionally lists, at a regional level, a number of frequency bands that administrations are encouraged to harmonise for PPDR applications. The actual agenda item states “to review and revise Resolution 646 (Rev.WRC-12) for broadband public protection and disaster relief (PPDR), in accordance with Resolution 648 (WRC-12)[34]”.

4.20 Resolution 648 (WRC-12) gives direction on the studies to be carried out in support of the review. In addition the use of PPDR systems has been given heightened global prominence over the past few years due in large part to a number of recent global incidents (both man-made and natural) that have required the deployment of PPDR

[32] http://stakeholders.ofcom.org.uk/consultations/700MHz/summary
[33] http://www.itu.int/oth/R0A0600001A/en
[34] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0017PDFE.pdf

systems. Added to this are the on-going technological developments of mobile systems which are now being sought by the PPDR community, including the integrated provision of high speed data, voice communications and real-time mobile video applications.

4.21 The review of Resolution 646 (Rev.WRC-12) will have to take account of studies, emerging developments and also assess whether additional identification of other frequency ranges is appropriate. At an international level there are already a number of bands identified in both ITU Regions 2 and 3 (including some for broadband services) but in ITU Region 1 (which includes the UK and all CEPT countries) there is currently only one frequency/tuning range, 380 – 470 MHz, that is identified for PPDR services.

4.22 The current CEPT view is that any action at WRC-15 needs to reflect that PPDR related radiocommunication matters are an issue of national sovereignty, and that PPDR requirements may vary, to a significant extent, from country to country. Therefore CEPT will consider future harmonisation of PPDR only if the action is flexible enough to consider different national circumstances including over the type of network which may be deployed. This could be a network which is dedicated to PPDR, a PPDR application within a commercial network or a hybrid of these solutions.

4.23 Also being discussed in CEPT is a proposal that the concept of a “frequency/tuning range”, which is already reflected upon in Resolution 646 (Rev.WRC-12), be expanded to offer full flexibility for administrations to decide how to provision their PPDR solutions. This flexibility would need to encompass network provisioned solutions that can be either dedicated to PPDR use or enable arrangements for PPDR services to be provided in bands used by commercial network providers. It is also envisaged that seamless cross border operations between countries, possibly using a common technology that is designed to use a number of frequency bands, would fit under this concept.

4.24 Ofcom has consulted with Government and PPDR agencies (i.e. our emergency services) in the UK and we have agreed that decisions around spectrum use for PPDR networks should remain a national issue. This means that any harmonisation measures taken internationally must be flexible enough to enable both dedicated and commercial networks.

4.25 Therefore the UK would oppose any harmonisation measure which would remove the flexibility needed by our PPDR agencies to allow them to choose the most appropriate spectrum solution nationally. At the forefront of our concern would be a situation where only dedicated PPDR bands were identified for emergency service use which would limit national solutions. However we do see the value in internationally identified spectrum ranges for PPDR, where there are possibilities to benefit from the economies of scale and national flexibility is retained.

4.26 Ofcom also believe that there is a need for international standards to support these flexible solutions so manufacturers can produce integrated chipsets using a common technology platform for use in PPDR user terminals, ideally on a global or regional basis. A good example of this is the on-going work in 3GPP which is working on integrating PPDR user requirements into the LTE standard.

4.27 Finally, Ofcom also recognises the particular interest being given to the 700 MHz band under this agenda item. We expect discussions on possible frequency arrangements and band plans, for 700 MHz, will be addressed under WRC-15

Agenda Item 1.2 and not under this agenda item. Additionally we support the further development of the International Mobile Telecommunications (IMT) Recommendation as a delivery platform for PPDR, not just in the 700 MHz band but in other IMT designated bands as well.

4.28 If you would like to discuss this agenda item in more detail, Andrew Gowans is co-ordinating the UK views and can be contacted by e-mail: Andrew.Gowans@ofcom.org.uk.

Question 13: Do you agree that any harmonisation measures for PPDR use should be sufficiently flexible to enable PPDR agencies to choose the most appropriate spectrum solutions nationally?

Agenda Item 1.4 – Amateur service, on a secondary basis, within the 5 250-5 450 kHz band

4.29 The rationale for this agenda item is to ascertain whether it will be possible for the amateur service to be compatible with other services around 5 300 kHz, and thereby allocate a portion of the 5 250 – 5 450 kHz band, globally, to the amateur service. Currently the band 5 250 to 5 450 kHz is allocated to the fixed and mobile services (not aeronautical) but not to the amateur service.

4.30 Within the UK, parts of the band are licence exempt to the amateur service and this has been the situation for a number of years. It will not be possible to allocate the whole band to the amateur service, within the UK, due to UK Ministry of Defence (MOD) interests. UK use is already agreed with MOD and is limited to 11 specific sub bands[35]. Therefore any agreement for an allocation would be alongside this agreement for UK amateur access to the band.

4.31 Whilst some administrations in CEPT have already proposed No Change for this Agenda Item, more recent proposals for a secondary allocation have appeared in the CEPT process. We are discussing with the MOD whether the UK can support an allocation, noting that any allocation should not compromise the agreed frequencies, in the UK, allowing amateur access to the band.

4.32 If you would like to discuss this agenda item in more detail, Steve Alexander is co-ordinating the UK views and can be contacted by e-mail: Steven.Alexander@ofcom.org.uk

Question 14: Do you have any comments on the potential use by the amateur service in the 5 250 to 5 450 kHz band?

Agenda Item 1.6 - Additional fixed satellite allocations between 10 and 17 GHz

4.33 The proposal under this agenda item is for additional fixed satellite service (FSS) spectrum allocations in the range 10 – 17 GHz (Ku band). This would be used to satisfy the predicted growth in demand for services, such as; VSAT[36], DTH[37]

[35] 5 258.5 to 5 264 kHz, 5 276 to 5 284 kHz, 5 288.5 to 5 292 kHz, 5 298 to 5 307 kHz, 5 313 to 5 323 kHz, 5 333 to 5 338 kHz, 5 354 to 5 358 kHz, 5 362 to 5 374.5 kHz, 5 378 to 5 382 kHz, 5 395 to 5 401.5 kHz, 5 403.5 to 5 406.5 kHz

[36] VSAT – Very Small Aperture Terminal: a two-way satellite ground station or a stabilised maritime satellite antenna with a dish antenna diameter that is normally smaller than 3 meters. VSATs are most commonly used to transmit narrowband data (point of sale transactions such as credit card, polling or general data) as well as broadband data (for the provision of satellite internet access).

[37] DTH – “Direct To Home”

broadband internet and television, satellite news gathering and telecommunication links.

4.34 At a global level, there is currently less FSS Ku band spectrum in Region 1 compared with Regions 2 and 3. It is argued that making equal FSS allocations across the three ITU Regions would simplify the planning of satellite networks that have coverage areas spanning more than one ITU Region. In addition, there is an imbalance of uplink and downlink spectrum within Regions 2 and 3, where there is less uplink spectrum compared to the downlink. Addressing these spectrum imbalances could simplify the design and construction of satellite networks and lead to reduced cost of services.

4.35 For Region 1, the current CEPT view is to support additional primary allocations of 250 MHz (Earth-to-space and space-to-Earth) to the GSO-FSS in frequency bands between 10 and 17 GHz. However this can only be considered where studies demonstrate compatibility with the existing services, with the application of mitigation techniques if required (e.g. PFD mask, limitation of transmit antenna size, orbital separation etc.). The bands under consideration are:

FSS (space-to-Earth)

- 13.4 - 13.75 GHz with preference for the band 13.4 - 13.65 GHz to allow a gap below the existing up-link FSS allocation in the band 13.75 - 14.5 GHz;
- 14.8 - 15.35 GHz

FSS (Earth-to-space)

- 14.5 - 14.8 GHz

4.36 For Regions 2 and 3, CEPT also supports a worldwide allocation for additional primary allocations (Earth-to-space) to the GSO-FSS in frequency bands between 13 and 17 GHz. CEPT considers that the additional allocation of 250 MHz to FSS (Earth-to-space) in Region 2 and of 300 MHz in Region 3, in frequency bands between 13 and 17 GHz could be made. However technical compatibility needs to be ensured with respect to other radio services operating, in Region 1, in the frequency bands under consideration.

4.37 CEPT does not support any additional allocation to FSS in frequency bands 10.6-10.68 GHz and 15.35 - 15.4 GHz in Region 1. It also does not support additional allocations to FSS (E-s) in the frequency bands 13.25 - 13.75 GHz and 15.35 - 15.4 GHz in Regions 2 and 3 due to the difficulty of sharing with passive services operating in these bands.

4.38 The UK is of the view that the potential bands for new primary FSS allocations should be studied thoroughly to assess the impact on use by existing services. If constraints would need to be placed on existing services, to facilitate sharing, further studies on the demand and justification for use of the spectrum would need to be carried out to help inform a decision about possible new FSS allocations. As a result the UK position on this agenda item is not yet finalised and is dependent upon the results of these studies, which we are monitoring and assessing.

4.39 If you would like to discuss this agenda item in more detail, James Richardson is co-ordinating the UK views and can be contacted by e-mail: James.Richardson@ofcom.org.uk

Question 15: Do you agree that if any allocations to the fixed satellite service in the 10-17 GHz range impose undue constraints on existing services then further studies on the demand and justification for use of the spectrum would need to be carried out?

Agenda Item 1.7 – Review of FSS use in the band 5 091 -5 150 MHz

4.40 The frequency band 5 091 – 5 150 MHz has a number of allocations within it, some of which are related to aeronautical use. One of these aeronautical uses is for microwave landing systems (MLS), and this band was originally identified for additional capacity where the core MLS band at 5 030 – 5 091 MHz reached capacity. In addition the band is allocated, on a primary basis, to the fixed satellite service (FSS) where it is used for feeder links to non-geostationary mobile satellite systems.

4.41 The potential for FSS to make use of the band, which was agreed back in WRC-97, comes with certain regulatory requirements and technical limitations so as to protect the potential for MLS to use the band where demand dictates it is necessary. This agenda item is exploring whether these limitations and requirements can be relaxed to allow for expanding FSS use in the band in future.

4.42 In the main, most of the MLS use is accommodated in the band 5 030 – 5 091 MHz and, at least in the UK, there does not appear to have been any requirement to make use of the band 5 091 – 5 150 MHz for MLS. Within CEPT there is support to remove some of the limitations (including timing restrictions) on FSS use, whilst continuing to recognise the established regulatory framework. The UK is supportive of the CEPT position.

4.43 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk

Question 16: Do you agree that the UK should support retaining the recognition for aeronautical radionavigation use, but equally support reviewing the limits associated with the FSS with a view to facilitating better use by the FSS?

Agenda Item 1.9 (1.9.1) - Additional fixed satellite (FSS) allocations in the 7/8 GHz bands

4.44 Agenda Item 1.9 is split into two parts. The second part of this agenda item (AI 1.9.2) is addressed in the Transport, including radiodetermination section later in this document.

4.45 The 7/8 GHz bands are largely used by administrations for non-civil services and administrations are reporting a shortfall of spectrum available for their current and future applications in this band. It is expected that continued increase of data passing over these networks will result in a need for additional spectrum. The UK Ministry of Defence has identified a requirement for additional FSS capacity in these bands.

4.46 CEPT supports new primary worldwide FSS allocations of 2x100 MHz in the bands 7 150 – 7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space) under the following conditions:

- Their use is limited to geostationary FSS satellites;

- FSS space stations in the band 7 150 – 7 235 MHz shall comply with an e.i.r.p mask to protect the Space Research Service (SRS);

- FSS Earth stations in the band 8 400 – 8 500 MHz shall operate at specified fixed points with a minimum antenna diameter of 3.5 m (consistent with Resolution 758 (WRC-12)[38] and shall be subject to coordination under RR Nos. 9.17 and 9.17A; and

- FSS space stations in the band 8 400-8 500 MHz and FSS earth stations in the band 7 150-7 250 MHz shall not claim protection from SRS, i.e. footnote RR No. 5.43A does not apply.

4.47 The UK recognises the need for additional spectrum for FSS with a view to allowing flexible and shared use of the 7/8 GHz bands where possible. UK supports the CEPT position, as stated, recognising the conditions identified above. We also believe that in order to ensure sharing with other services, it will be necessary to require the use of large FSS satellite earth stations (i.e. earth stations with a diameter equal to or greater than 3.5 m) to limit the potential for interference to other services.

4.48 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk@ofcom.org.uk

Question 17: Do you agree that the UK should support new primary allocations for the fixed-satellite service in the 7/8GHz bands, with the proposed restrictions?

Agenda Item 1.10 - Additional mobile satellite IMT allocations in the 22-26 GHz range

4.49 This agenda assesses the potential for new mobile satellite service allocations for IMT in the 22-26 GHz band (Resolution 234 – WRC-12[39]). This item is, to a certain extent, a response to the outcome of WRC-12 AI 1.25[40] where it was agreed not to make new MSS allocations, although those would have been in different frequency bands to those being considered under this agenda item. As a result some administrations felt that it would be beneficial to assess frequency bands in ranges above those considered at WRC-12.

4.50 This Agenda Item was proposed at WRC-12 by the United Arab Emirates and, in the time since WRC-12, there has been very little international activity or support for this agenda item.

4.51 The CEPT position is to oppose an MSS allocation in the range between 22-26 GHz.

4.52 The UK has an interest in the 22-26 GHz frequency range from the perspective of existing usage, including fixed links, radio astronomy (and other scientific use in the bands), as well as amateur radio use. There also does not appear to be any UK satellite stakeholder interest. For these reasons the UK does not support a new MSS allocation within the range 22-26 GHz and supports the current CEPT position.

[38] Resolution 758 (WRC-12) - http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0026PDFE.pdf
[39] Resolution 234 (WRC-12) - http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0012PDFE.pdf
[40] The proposal under WRC-12 AI 1.25 was to secure additional mobile satellite service allocations, particularly in the 4 to 16 GHz frequency range. The decision of WRC-12 was for “no change”, meaning no additional allocations were made.

4.53 If you would like to discuss this agenda item in more detail, John Rogers is co-ordinating the UK views and can be contacted by e-mail: John.Rogers@ofcom.org.uk

Question 18: Do you agree that the UK should not support new allocations for the mobile satellite service in 22-26 GHz as they are not justified and that the focus should instead be upon the continued protection of the incumbent services?

Section 5

Transport, including Radiodetermination

5.1 This section addresses the following agenda items:

1.5	Use of fixed-satellite service bands for the control of unmanned aircraft
1.8	review of the provisions relating to earth stations located on board vessels
1.9 (1.9.2)	Potential allocations to the maritime-mobile satellite service in 7/8 GHz
1.15	Spectrum demands for maritime on-board communications
1.16	Development of the maritime Automatic Identification System (AIS)
1.17	Potential allocations for wireless avionics intra-communications (WAIC)
1.18	Radar allocation for automotive applications in 77.5 - 78.0 GHz

Agenda Item 1.5 - Use of fixed-satellite service bands for the control of unmanned aircraft

5.2 This agenda item is being considered at WRC-15 primarily as a result of the non-agreement at WRC-12 for one particular element of an agenda item related to unmanned aircraft (UA). Specifically, whilst the UA Agenda Item (at WRC-12) identified aeronautical allocations that can be used for the control of UA, the specific item addressing the use of frequency bands allocated to the Fixed Satellite Service (FSS) was not agreed.

5.3 As before, the scope of this agenda item is addressing the safe operation of the UA only. Additional spectrum requirements, not directly related to the safe operation of UA, are not being considered (i.e. spectrum requirements for applications carried by the UA but not used to control it - payload). This safe-operation of UA is referred to as control and non-payload communications (CNPC).

5.4 The UK was supportive of the WRC-12 Agenda Item on UA in general. However this more specific Agenda Item, which addresses the potential use of FSS allocations for UA systems, was primarily driven from the USA and was the element of the previous agenda item that the UK and CEPT did not support at WRC-12.

5.5 Whether or not FSS spectrum allocations meet the technical requirements required for UA systems is a matter for technical study and these studies are being conducted in ITU and CEPT. In addition ICAO would need to supply detailed technical information into the process for a full assessment to be undertaken. ICAO would also need to provide a final endorsement before any new arrangement could be implemented. On such matters Ofcom looks to the UK aviation regulator, CAA[41], for its view and it has indicated support for the current ICAO position which requires UA use to be within a specific AMS(R)S[42] allocation. Ofcom has no role in aviation regulation; however the optimal use of spectrum is one of our statutory duties and outside the consideration of aviation regulatory requirements, Ofcom can see the benefits delivered through the better use of fixed satellite spectrum.

5.6 Noting the CAA's position in the wider regulatory context, the UK does not currently support the use of FSS allocations for the command and control of unmanned aircraft

[41] Civil Aviation Authority
[42] Aeronautical Mobile Satellite (Route) Service: an aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes

systems. However, Ofcom will continue to monitor the on-going work being undertaken in both CEPT and ITU on this agenda item. We will also continue to engage in discussions within CEPT where views are currently split between those that are supporting use of FSS and those that are not.

5.7 If you would like to discuss this agenda item in more detail, Stephen Limb is co-ordinating the UK views and can be contacted by e-mail: Stephen.Limb@ofcom.org.uk

Question 19: What are your views on the use of FSS spectrum allocations for UAS, recognising the shared regulatory responsibility and the safety considerations for the control of unmanned aircraft?

Agenda Item 1.8 - review the provisions relating to earth stations located on board vessels (ESVs)

5.8 The purpose of this Agenda Item is to review the provisions relating to earth stations located on board vessels (ESVs) that transmit in the fixed satellite service (FSS) uplink bands at 5 925 – 6 425 MHz and 14.0 - 14.5 GHz.

5.9 Under existing arrangements, the minimum distance from a coastal state that an ESV can operate is 300 km in the 5 925 – 6 425 MHz band and 125 km in the 14.0 - 14.5 GHz band. These minimum distances are necessary to ensure that transmissions from ESVs do not interfere with terrestrial fixed services that the coastal state may be operating. Operation of an ESV within the minimum distance is possible but only with the prior agreement of the concerned coastal state.

5.10 The technology used by ESVs has advanced considerably since their introduction, including the use of spread-spectrum modulation and other techniques which may improve compatibility with terrestrial co-frequency services. The limitations and restrictions on ESVs are now under review in light of the new technologies being deployed.

5.11 CEPT does not object to a reduction of the separation distances for new ESV technologies providing that use of the band by terrestrial services is not impacted. Furthermore, CEPT supports the establishment of a set of different protection distances for different maximum e.i.r.p. density levels towards the horizon. The exact values of protection distances need to be determined. The UK has been monitoring the studies with a view to developing a position on the overall regulatory environment, taking into account the need for flexibility and efficient use of spectrum where this is possible. Therefore the UK is awaiting the results of the on-going technical study work and engaging in CEPT discussions, before confirming a final position.

5.12 If you would like to discuss this agenda item in more detail, James Richardson is co-ordinating the UK views and can be contacted by e-mail: James.Richardson@ofcom.org.uk

Question 20: Do you have any view on the need, or otherwise, to modify the restrictions that relate to the operation of ESVs in the bands 5 925 – 6 425 MHz and 14-14.5 GHz?

Agenda Item 1.9 (1.9.2) - Potential allocations to the maritime-mobile satellite service in 7/8 GHz

5.13 This agenda item is to consider the possibility of allocating the bands 7 375 – 7 750 MHz and 8 025 - 8 400 MHz to the maritime-mobile satellite service.

5.14 The current CEPT position is;

- to support the technical studies assessing the possibility of making a new allocation to the maritime mobile satellite service (MMSS) in the bands as referenced, subject to not placing undue constraints on and ensuring the protection of, the services already allocated in these frequency bands.

- not to support the usage of these bands for applications that could result in the deployment of a large number of earth stations. In particular, CEPT does not support the usage of the bands for e-navigation[43] or the GMDSS[44] as this would require appropriate regulatory mechanisms which have not yet been defined.

- that studies show that compatibility between the earth exploration satellite service and the maritime mobile satellite service in the 8 GHz band requires the establishment of large exclusion zones around earth stations, used by the earth exploration satellite service. This would require the maintenance of an exclusion zones database and the enforcement of these exclusion zones makes such a proposed allocation impractical.

- in addition, CEPT notes that the protection of space research stations in deep space operation, in adjacent bands, would have to be ensured through a combination of unwanted emission limits and/or exclusions zones, therefore adding to the constraints on the maritime mobile satellite service.

5.15 As a result, CEPT does not support an allocation for the maritime mobile satellite service in the 8 GHz band without acceptable and practicable regulatory methods.

5.16 In the UK there are varied UK interests that make use of these bands, including Ministry of Defence, fixed service links, PMSE and earth exploration satellites. The UK concurs with the CEPT that the results of technical analysis suggests that for some of the services mentioned, achieving compatibility will be very challenging. We would like to gain a more detailed understanding of the justified requirements for new allocations for the maritime-mobile satellite service before coming to a decision. We also note that no UK interests in an allocation have so far been identified.

5.17 Thus the UK supports protection of existing services in the bands under consideration for MMSS allocations. We agree that current technical evidence suggests that sharing between MMSS and incumbent services is extremely difficult due to the requirement for large separation distances and the practical difficulties of coordinating maritime satellite terminals.

[43] e-navigation is an IMO strategic vision to integrate existing and new maritime navigational tools, in particular electronic tools, in an all-embracing system that will contribute to enhanced navigational safety for the maritime sector.
[44] GMDSS – Global Maritime Distress & Safety Service: an international system which uses terrestrial and satellite technology and ship-board radio-systems to ensure rapid, automated, alerting of shore based communication and rescue authorities, in addition to ships in the immediate vicinity, in the event of a marine distress.

5.18 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 21: What are your views on a potential new allocation to the maritime mobile satellite service, recognising the UK interest in the other services that make use of the bands under consideration?

Agenda Item 1.15 - Spectrum demands for maritime on-board communications

5.19 This agenda item considers the spectrum demands in the UHF band, for maritime mobile on-board communications. Whilst the maritime service makes use of a number of frequency bands, mainly for ship to shore communications and maritime safety, UHF[45] spectrum is identified for use on-board vessels, between vessels under tow and between vessels and life craft. Although not recognised in the same way as those frequencies that are used in support of the Global Maritime Distress & Safety Service (GMDSS), these frequencies are identified in the Radio Regulations (RRs), predominantly for communications within a vessel or those vessels under tow by it. Presently there are 10 frequencies identified for on-board use, with some regional limitations which further reduces availability.

5.20 This was a CEPT supported proposal and presently the evidence in CEPT seems to suggest that the primary issue is confusion as to what frequencies are actually available for this type of use. As a result, the emerging CEPT view is that;

- greater clarity should be brought to the actual frequencies available for on-board UHF; and
- that the use of channels with a 12.5 kHz separation be referenced in the RRs (currently a 25 kHz separation is identified) as this would lead to an increase in the channels available.

An overall increase in the amount of actual spectrum identified for on-board use does not have support either in CEPT or internationally. More recently, the idea of digital modulation and 6.25 kHz channel spacing has also been discussed both in CEPT and internationally and we are reviewing that work and listening to views from UK stakeholders. CEPT does not support the imposition of dates from which only certain bandwidths and/or modulation systems are permitted and the UK agrees with this position.

5.21 From a UK perspective, we would agree that there is limited evidence to support the identification of additional spectrum for on-board use and we are supportive of the emerging CEPT view which is to make better use of the current spectrum available for on-board communications.

5.22 If you would like to discuss this agenda item in more detail, Steven Alexander is co-ordinating the UK views and can be contacted by e-mail: Steven.Alexander@ofcom.org.uk

Question 22: Do you agree that the UK should not support a proposal for additional UHF spectrum for maritime on-board communications and that narrower channels will help to increase capacity?

[45] UHF = Ultra High Frequency, relates to a frequency range of between 300 and 3000 MHz, and for this particular case the range 450 – 470 MHz.

Agenda Item 1.16 – Development of the maritime Automatic Identification System (AIS)

5.23 The intent under this agenda item is to develop the use of the AIS and to ensure the retention of the main navigational AIS channels; AIS1 and AIS2. This follows changes that were agreed at WRC-12 (review and changes to the VHF band used by Maritime: RR Appendix 18). This agenda item is of importance to the maritime community but, under the current proposals, has little impact on other services due to the fact that all proposals are addressing spectrum allocations that are already identified for use by maritime services.

5.24 The use of AIS for navigation is important for the maritime industry and initial views are that the integrity of the existing AIS system should not be compromised through any of the proposed changes. Currently this is the view held by the majority of countries participating in the work.

5.25 In CEPT, and internationally, there has been developing discussion around a concept referred to as VHF Data Exchange System (VDES). This is a proposed system where maritime navigational information can be distributed via a network of land based stations and a complementary satellite network. Discussions have focused on making use of spectrum within Appendix 18 that was identified for data services at WRC-12.

5.26 The general concept of VDES is supported by CEPT. Additionally the International Association of Lighthouse Authorities (IALA) has also taken an interest in this agenda item and has developed ideas in parallel. The view of the International Maritime Organisation (IMO) is that further development of the VDES concept is to be supported by IMO, without committing the Organisation regarding future requirements on the use of the VHF frequency band (RR Appendix 18).

5.27 From a UK perspective, whilst we support the international developments of VDES, we additionally recognise that any full and wide adoption of such a system would require endorsement and recognition by the IMO for the full benefits to be realised and at this stage the IMO has yet to come to a final decision on this agenda item. Currently the UK supports the CEPT proposed channelling arrangements for VDES. However we also recognise that there needs to be a balance between the developments of the VDES concept, alongside the continued need for capacity for services such as port operations and vessel traffic services (VTS) which currently make use of the channels in Appendix 18 of the Radio Regulations.

5.28 If you would like to discuss this agenda item in more detail, Steven Alexander is co-ordinating the UK views and can be contacted by e-mail: Steven.Alexander@ofcom.org.uk

Question 23: What are your views on any necessary regulatory provisions for AIS in the bands already identified for maritime use?

Agenda Item 1.17 - Potential allocations for wireless avionics intra-communications (WAIC)

5.29 This agenda item, which was supported by both CEPT and the Americas group, is considering potential allocations and regulatory provisions that would facilitate the operation of a new aviation application: WAIC – wireless avionic intra-communications. This application would be used to replace the majority of the wired infrastructure on an aircraft, which is used for control of the aircraft, with a radio

system. This system would be used for a variety of control systems on board an aircraft, but would not be used for communications between aircraft or for non-flight systems (i.e. entertainment systems).

5.30 Up to now the work in ITU and CEPT has been to study, at a technical level, spectrum allocations that are predominantly used by aviation applications (e.g. radar, aeronautical navigation etc.) to assess the potential for WAIC to work alongside existing use. A number of bands have been studied and currently there is an initial focus at both CEPT and international level on the 4 200 – 4 400 MHz band.

5.31 This is another agenda item that is linked to the final agreement of ICAO and as a result Ofcom looks to the UK aviation regulator CAA[46] for its view. CAA's view is that an appropriate aeronautical allocation be identified (i.e. AM(R)S[47]) and that the technical compatibility with the existing aviation applications in the band should be ensured. Therefore where these elements are satisfied then the UK supports regulatory provisions that allows for the operation of WAIC systems. This mirrors the current CEPT position.

5.32 If you would like to discuss this agenda item in more detail, Stephen Limb is co-ordinating the UK views and can be contacted by e-mail: Stephen.Limb@ofcom.org.uk

Question 24: Where the appropriate radio regulatory provisions are established for use in existing aviation related bands, do you agree that the UK should support regulatory conditions for the accommodation of WAIC applications?

Agenda Item 1.18 – Radar for automotive applications in 77.5 - 78.0 GHz

5.33 Under this agenda item, the proposal is to investigate the potential to add an allocation to the radiolocation service for automotive applications in the 77.5 - 78.0 GHz frequency band. Presently there is a radiolocation allocation in the bands below (76 - 77.5 GHz) and above (78 - 79 & 79 – 81 GHz); and European level regulations that identify the band 77 – 81 GHz for short range automotive radar. These apply at both the CEPT[48] and EU[49] level and the EU regulations are binding upon the member states of the EU.

5.34 This was a CEPT and Asia-Pacific supported agenda item at WRC-12. There is an on-going discussion around compatibility with other services that make use of the band (amateur, amateur satellite and radio astronomy) and more recently the discussions have been around whether this proposed allocation needs to be limited to automotive use only. Some feel that there should merely be technical conditions for any type of radiolocation use in the band and not only for automotive use.

5.35 At present, the CEPT position on this agenda item is open although there is some international support, mainly at a European level, to maintain the restriction. The UK would be supportive of a generic radiolocation allocation, where appropriate technical compatibility requirements to protect incumbent services are applied.

[46] Civil Aviation Authority
[47] Aeronautical Mobile (Route) Service: An aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.
[48] http://www.erodocdb.dk/docs/doc98/official/word/ECCDec0403.doc.
[49] http://eur-lex.europa.eu/legal-content/en/NOT/?uri=CELEX:32004D0545 and http://eur-lex.europa.eu/legal-content/en/NOT/?uri=CELEX:32005D0050

5.36 If you would like to discuss this agenda item in more detail, Robin Donoghue is co-ordinating the UK views and can be contacted by e-mail: Robin.Donoghue@ofcom.org.uk

Question 25: Do you agree that the UK should support a generic radiolocation allocation in the 77.5-78 GHz band, where appropriate technical conditions are established?

Section 6

Scientific use of spectrum

6.1 This section addresses the following agenda items:

1.11 Earth exploration-satellite service (Earth-to-space) in the 7 - 8 GHz range
1.12 Earth exploration-satellite (active) service in the 8/9/10 GHz bands
1.13 Distance limitation on space vehicles communicating with orbiting manned space vehicles
1.14 Reference time-scale and potential modification of coordinated universal time (UTC)

Agenda item 1.11 – Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range

6.2 This agenda item addresses the potential requirement for a primary allocation to the Earth exploration-satellite service (in the Earth-to-space direction) in the 7-8 GHz range. The Earth exploration-satellite service (EESS) requires an Earth-to-space allocation in the frequency band 7 190-7 235 MHz because of congestion in the bands 2 025 - 2110 MHz and 2 200 – 2 290 MHz.

6.3 There are many EESS satellites using the bands 2 025-2 110 MHz (E-to-s) and 2 200 - 2 290 MHz (s-to-E) for tracking, telemetry and control (TT&C). As a result, frequency coordination in these bands is very difficult. A new allocation in 7 – 8 GHz, along with existing space-to-Earth allocations near 8 GHz, would also allow EESS satellites to employ a single transponder for uplinks and downlinks, reducing design and launch costs, as well as helping to meet future demand.

6.4 The main UK interest in EESS is through UK Government investment in ESA space missions.

6.5 This agenda item was proposed by CEPT and USA. CEPT supports the allocation of the frequency band 7 190 – 7 250 MHz on a primary basis to the Earth exploration-satellite service (Earth-to-space). CEPT also recognises that the Space Operation Service (SOS), which is allocated in the Russian Federation in the band 7 190 – 7 235 MHz, needs to be protected and that sharing studies between EESS and SOS need to be finalised.

6.6 The current UK position is to support the sharing studies in ITU-R and CEPT to ensure protection of existing services in the band. Both UK and CEPT will make a final decision on the allocation once all studies are completed and once a clearer picture on the sharing situation has emerged.

6.7 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 26: Do you agree that the UK should support an allocation across the 7 190 – 7 250 MHz band, dependent upon the outcome of technical studies?

Agenda item 1.12 - Earth exploration-satellite (active) service in the 8/9/10 GHz bands;

6.8 This agenda item was proposed by CEPT and USA to use additional spectrum to meet a growing demand for better radar image resolution, to satisfy global environmental monitoring and other applications which can only be achieved by higher transmission bandwidth.

6.9 This agenda item involves conducting sharing studies with services currently in the bands 8 700 – 9 300 MHz and 9 900 - 10 500 MHz, as well as adjacent band compatibility with passive services in the band 10.6 - 10.7GHz.

6.10 CEPT is investigating the allocation of additional radio frequency spectrum of 600 MHz in the frequency bands 9.2 - 9.3 GHz and 9.9 - 10.4 GHz / 9.9 - 10.5 GHz to the Earth Exploration-Satellite Service (EESS) (active), where possible on a primary status. CEPT also considers that the stations in the Earth exploration-satellite service (active) shall not cause harmful interference to, nor claim protection from, stations operating in the Radiodetermination Services allocated in the same frequency bands. Provisions for the protection of Fixed, Mobile, Space Research and Radio Astronomy Services from EESS (active) will need to be implemented, as appropriate.

6.11 The current UK position is to review the sharing studies in ITU-R and CEPT to ensure protection of existing services in the bands 8 700 - 9 300 MHz and 9 900 - 10 500 MHz as well as protection of passive services in the adjacent band. UK and CEPT will make the decision on the allocation once all studies are completed and once a clearer picture on the sharing situation has emerged.

6.12 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 27: Do you agree that is right to wait for the relevant sharing studies to mature before coming to a final position on the potential for additional allocations to the earth exploration-satellite (active) service in the 8/9/10 GHz band?

Agenda item 1.13 - Distance limitation on space vehicles communicating with orbiting manned space vehicles;

6.13 WARC[50]-92 allocated the band 410 – 420 MHz to the Space Research Service (SRS) on a secondary basis to allow for extra-vehicular communications in the vicinity of Earth orbiting manned space vehicles. WRC-97 upgraded the allocation to the SRS in the band 410 - 420 MHz to primary status with the conditions given in RR No. 5.268. The use of the band by SRS is limited to within 5 km of orbiting manned space vehicles.

6.14 The band 410 - 420 MHz is used today for communications by astronauts conducting extra-vehicular activities (EVA) in the immediate vicinity of the International Space Station (ISS). The use of the band for proximity operations by vehicles approaching the ISS or other manned space vehicles would be advantageous.

6.15 Vehicles approaching the International Space Station (ISS), whether manned or robotic, need to communicate over somewhat longer distances to ensure safe operations and docking manoeuvres and therefore it's necessary to modify RR No.

[50] WARC stands for World Administrative Radio Conference, the forerunner of the WRC

5.268 to remove the 5 km limitation while maintaining the current pfd limits to protect terrestrial services.

6.16 Similarly, to allow for proximity operations with orbiting vehicles and not solely limit the use of the band for extra-vehicular activities, it is also necessary to modify No. 5.268 in such a manner as to remove the EVA limitation.

6.17 CEPT supports removing the distance limitation within RR No 5.268 and the restriction on use of the band for extra vehicular activities, while keeping the pfd limits to protect terrestrial services. The UK also supports this position.

6.18 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 28: Do you agree that the UK should support the CEPT position that removes the distance limitation on space vehicles communicating with orbiting manned space vehicles, whilst retaining the pfd limit to protect terrestrial services?

Agenda item 1.14 - Reference time-scale and potential modification of coordinated universal time (UTC);

6.19 This agenda item was created as a result of the outcome of the Radiocommunication Assembly[51] (RA-12) meeting held prior to WRC-12 and following discussions around proposed modifications to ITU-R Recommendation TF.460-6 to discontinue the insertion of leap seconds in the definition of UTC. Responsibility for approving the Recommendation was elevated to RA-12 since the relevant ITU-R groups that were working on that particular Recommendation could not achieve consensus, despite extensive debates over several years.

6.20 The elimination of leap seconds from the definition of UTC will effectively break the link between the current time standard and the rotation of the earth. Some operators of global navigational systems (e.g. Galileo and Global Positioning System - GPS) and the financial industry have argued that the insertion of leap seconds is difficult and burdensome to accommodate. They claim this is because it introduces uncertainty into those systems which have a critical reliance upon time.

6.21 The preliminary CEPT position is to support the necessary studies on the feasibility of achieving a continuous reference time-scale. This could be by either modification of UTC or by another method and would be the time standard subsequently disseminated by radiocommunication systems. CEPT also supports study on issues related to the possible implementation of a single continuous reference time-scale (studies that should include both technical and operational factors).

6.22 The UKs National Measurement Office (NMO), an Agency of BIS, advised by the National Physical Laboratory (NPL), leads on the development of UK policy on this agenda item. The UK welcomes further studies into the technical issues but at the present time the UK opposes the proposed revision of TF.460-6 which would remove recognition and use of the leap seconds in UTC.

6.23 The UK is supporting further study and discussion on the concept of dissemination of two reference time scales to meet the requirements of different users (i.e. civil

[51] Radiocommunication Assemblies (RA) are responsible for the structure, programme and approval of radiocommunication studies in the ITU.

timekeeping, space missions and banking and other international transactions etc). This will allow for the continuation of the leap second. To better gauge the UK public's view, Government has recently opened a period for public dialogue; https://www.gov.uk/government/news/leap-seconds-away-from-having-your-say-on-time-management. This will allow Government to be better sighted on the public's view on the matter and will help to inform the further development of the UK position.

6.24 If you would like to discuss this agenda item in more detail, Robert Gunn of the UKs National Measurement Office, is co-ordinating the UK views and can be contacted by e-mail: Robert.Gunn@nmo.gov.uk

Question 29: Do you agree that the UK should support maintaining UTC as currently defined (i.e. with the inclusion of leap seconds) and that the UK should support further study around the concept of dissemination of two reference time scales?

Section 7

Standing agenda items

7.1 This section addresses the standing agenda items which cover a range of recurring, housekeeping and reporting issues. The more significant of these agenda items are addressed below. The UK view of these agenda items will be developed much closer to WRC-15.

7.2 This section addresses the following agenda items:

7	Resolution 86 (Satellite networks);
8	Deletion of, or removal of names from, country footnotes;
9	Report of the Director of the Radiocommunication Bureau;
9.1	Activities of the Radiocommunication Sector since WRC-12
9.1.1	Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz
9.1.2	Studies on possible reduction of the satellite coordination arc criteria
9.1.3	Use of satellite orbital positions and associated spectrum by developing countries
9.1.4	Updating the Radio Regulations
9.1.5	Satellite use of 3.4 – 4.2 GHz, for aeronautical and metrological services
9.1.6	Studies towards review of the definitions of fixed service, fixed station and mobile station
9.1.7	Spectrum management guidelines for emergency and disaster relief radiocommunication
9.1.8	Regulatory aspects for nano and pico satellites
9.2	Any difficulties or inconsistencies encountered in the application of the Radio Regulations;
9.3	Action in response to Resolution 80 (Rev.WRC-07)

Agenda Item 7 - Resolution 86 (Satellite coordination and notification procedures)

7.3 Resolution 86[52] is a standing item to deal with “deficiencies and improvements” in the satellite filing procedures. There is potential for significant issues to be raised under this agenda item which may impact existing satellite users and operators, particularly due to the complexity of these procedures.

7.4 There is a relationship between this agenda item and ITU initiatives to improve implementation of the satellite filing procedures, as seen through ITU Radiocommunication Bureau (BR) Circular Letters and Workshops on the efficient use of satellite resources.

7.5 Issues under this agenda item tend to increase in number as the preparatory process advances. At this stage around 10 issues have been identified, many of which relate to additional clarification of the substantial changes to the rules on bringing into use and suspension that were made at WRC-12.

7.6 Five of these issues are included in the draft CEPT Brief:

[52] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0032PDFE.pdf

Informing the BR of a suspension under No 11.49 beyond six months

7.7 WRC-12 modified RR No. **11.49** so that administrations must inform the Bureau of suspensions lasting longer than six months as soon as possible, but in any case no later than six months from the start date of the suspension. WRC-12 did not specify the consequences for the assignments of an administration that failed to report a qualifying suspension by the six-month deadline. Several methods have been identified to resolve this issue with CEPT opting to defer taking a position until the responsible ITU-R Working Party (Working Party 4A - WP4A[53]) has finalised the draft CPM text. Discussion in the UK has indicated a preference for the method whereby the overall period of suspension is reduced in proportion to the period of delay in informing the BR, so that for example informing the BR one month after the initial six month period results in a corresponding reduction of one month in the overall suspension period.

Publication of information on bringing into use of satellite networks on the ITU website

7.8 This issue seeks to clarify the actions of the Radiocommunication Bureau, and their timing, after receiving information from the administration on bringing into use and suspension of frequency assignments of satellite networks. CEPT supports full clarity in the Radio Regulations to the Bureau's procedure for publishing and making available information relating to bringing into use and suspension of frequency assignments of satellite networks, by adding the following sentence to the end of Nos. 11.44B and 11.49: 'On receipt of the information sent under this provision, the Bureau shall make available that information as soon as possible and shall publish it in the BR IFIC'. The current UK view is to support this position.

Transfer into the Radio Regulations of the Rule of Procedure regarding suspension of a frequency assignment in the List in Appendix 30B

7.9 WRC-12 approved the application of the extension of the suspension period from two years to three years in regard to RR Appendix 30B via a Decision of Plenary, thus harmonizing the practices in RR Appendix 30B with those in RR Article 11 and RR Appendices 30 and 30A (Rev.WRC-12). The Bureau applies this WRC-12 decision through a Rule of Procedure which was approved in the 60th meeting of the Radio Regulations Board. However, there are no such provisions in procedures of the FSS Plan in RR Appendix 30B, and therefore corresponding amendments to the RR still need to be prepared for approval by WRC-15. CEPT supports transfer of the Rule of Procedure into Appendix 30B of the Radio Regulations. The current UK view is to support this position.

Review of the advance publication mechanism for satellite networks subject to coordination under Section II of Article 9 of the Radio Regulations

7.10 There is a period of approximately 15-16 months between the receipt of Advance Publication Information[54] (API) and the publication of the definitive list (6 months between the API and coordination request, 3-4 months to publish the coordination request, 4 months to comment and approximately 2 months to publish the definitive list following the comments). This period of 15-16 months is almost entirely dedicated to administrative work leading to the establishment of the coordination requirements

[53] Working Party 4A (WP 4A) - Efficient orbit/spectrum utilisation for FSS and BSS

[54] The API or Advance Publication Information is a set of initial data about a proposed satellite network to be published by the ITU.

and represents nearly 20% of the seven-year period after the date of receipt of API to bring into use the frequency assignments to the satellite network. With this in mind, and in view of the limited information it contains, it is proposed to completely suppress the API mechanism for satellite networks subject to coordination under Section II of Article 9. CEPT's preliminary position is to support removal of the initial six-month non-receivability period between date of receipt of API and receivability of the coordination request, and study whether the API mechanism can be completely suppressed for satellite networks subject to coordination under Section II of Article 9. During the UK discussions, no firm view has yet emerged.

Comprehensive review of radio regulatory process under WRC-15 agenda item 7

7.11 Under Agenda Item 7 the question has arisen as to whether there should be a complete overhaul of the regime governing space services, or whether the current evolutionary approach of considering individual issues at the WRC should be maintained. CEPT does not support a general overhaul of the regime governing space services and does not support the creation of an Expert Group to examine the issue and prepare detailed provisions and associated technical criteria for consideration by the next WRC. CEPT supports retaining the current process of continuing evolution at successive WRC's of the regime governing space services. The current UK view is to support the CEPT position.

7.12 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk

Question 30: Do you have any comments on the UK approach and positions on the elements of Agenda Item 7?

Agenda Item 8 - Deletion of, or removal of names from, country footnotes

7.13 Footnotes to the table of frequency allocations in the Radio Regulations provide alternative arrangements for named countries. The removal of names from country footnotes under this agenda item presents a relatively straightforward exercise in checking the need for the various footnotes in which the UK appears in and as such is low priority. However, it should be noted that there is also a need to check proposals from other countries to ensure there is no adverse impact to the UK, e.g. if a country withdraws from a footnote which was giving a more favourable co-ordination situation than the table allocation. This can normally only be done relatively late in the process and sometimes during the conference itself.

7.14 If you would like to discuss this agenda item in more detail, Wesley Milton is co-ordinating the UK views and can be contacted by e-mail: Wesley.Milton@ofcom.org.uk

Agenda Item 9 - Report of the Director of the Radiocommunication Bureau

7.15 The report of the Director can give rise to major issues, for example where the Radio Regulations Board (RRB) has been unable to resolve controversial issues, e.g. cases involving satellite filings and networks or radiocommunications use for Earth observation applications.

7.16 It is comprised of 3 main parts – 9.1 is a group of issues (9.1.1 to 9.1.8) on which the Director of the BR was specifically tasked, in various WRC-12 Resolutions, to report

to WRC-15. Agenda Item 9.2 is a report on issues identified by the BR in its experience of the application of the radio regulatory procedures, and AI 9.3 is a report on the actions of the Radiocommunication Bureau and the Radio Regulations Board on Resolution 80[55] ('Due diligence in applying the principles embodied in the Constitution'). Only those sub issues of Agenda Item 9.1 that are thought of particular interest are addressed below.

Agenda Item 9.1, issue 9.1.1 - Protection of the mobile-satellite service in 406 - 406.1 MHz

7.17 This item draws the attention of the conference to the use of this band by the mobile-satellite service, and particularly, by distress and search and rescue (SAR) systems generally referred to as Cospas-Sarsat.

7.18 The International Cospas-Sarsat Programme assists SAR activities on a worldwide basis by providing distress alert and location data to the international community. Alert messages triggered by 406 MHz beacons, detected by a network of (GSO and NGSO) satellites, which in turn are relayed (via the SAR band 1 544 – 1 545 MHz) to control centres on the ground, assisting in both land and sea rescue situations.

7.19 Some concerns were raised during WRC-12, that the internationally agreed protection limits for this satellite network were not sufficient for its effective operations. Therefore WRC-12 agreed that ITU should undertake technical studies to ascertain whether the current regulatory environment provides adequate protection to this service, recognising the safety and distress related nature of this communication system.

7.20 As the Cospas-Sarsat system is used in distress and safety situations and as there is general recognition of the need to detect and successfully process the signals at 406 MHz, there is interest at both a national and international level. At a national level, Ofcom maintains regular engagement with those organisations, such as the Maritime and Coastguard Agency (MCA) and the Civil Aviation Authority (CAA), who have responsibilities in this area in the UK.

7.21 On the other hand, there is also recognition of the need to not place undue constraints on existing and planned systems in the adjacent frequency bands (e.g. 390 - 406 MHz and 406.1 – 420 MHz).

7.22 CEPT supports the needs of Cospas-Sarsat as well as the needs of other services in adjacent bands which should not be unnecessarily constrained. In order to ensure adequate protection of MSS systems (e.g. Cospas-Sarsat) in the frequency band 406-406.1, CEPT supports a revision of Resolution 205[56] (Rev. WRC-12) containing mitigation measures.

7.23 The UK fully supports the operation and protection of the Cospas-Sarsat system. However, we are keen to ensure that any new Radio Regulatory (RR) provisions seeking an increase in the protection of Cospas-Sarsat receivers is balanced by a need to urge continual improvement in the out of band filtering of the Cospas-Sarsat satellites provided by Administrations. The technical and regulatory detail around how such protection can be met is currently under discussion within Europe. The UK is monitoring developments and will take a final position once that information is finalised.

[55] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0031PDFE.pdf
[56] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0009PDFE.pdf

7.24 If you would like to discuss this agenda item in more detail, John Rogers is co-ordinating the UK views and can be contacted by e-mail: John.Rogers@ofcom.org.uk

Question 31: Do you agree that any potential regulatory constraints need to be fair and proportionate on both the Cospas-Sarsat operation and users in the adjacent band?

Agenda Item 9.1, issue 9.1.2 – Studies on possible reduction of the satellite coordination arc

7.25 In the ITU Study Groups, studies are being undertaken to assess the appropriateness and effectiveness of the current technical criteria in the Radio Regulations for identifying coordination under RR No 9.41, and to consider possible alternatives. Also whether the current values of the 'coordination arc' (an orbital separation, in degrees, either side of a proposed geostationary satellite network), can be reduced (in Ka band), or further reduced (in C and Ku band) from the values agreed at WRC-12.

7.26 Under the studies, three main issues have arisen:

i) whether the existing method of identifying a coordination requirement, which is when there is an increase in noise temperature ($\Delta T/T$) of more than a certain percentage, is the most appropriate method, or whether a method of C/I calculation should be used (ie, coordination required when C/I < C/N - I/N dB);

ii) whether, given the current population of geostationary satellites operating in C and Ku band, the existing trigger level $\Delta T/T > 6\%$ (or equivalently C/I < C/N + 12.2 dB) in these bands is too conservative, and whether this could be increased;

iii) whether a power flux density level could be adopted at the notification stage which, if met without coordination having been agreed, would remove the requirement to coordinate.

7.27 In addition, the agenda item calls for studies into the possibility of reducing the coordination arc in C, Ku and Ka band from the values that were agreed at WRC-12 (8, 7 and 8 degrees respectively).

7.28 The current CEPT position is to support retention of No 9.41 but, in its application, replace the $\Delta T/T > 6\%$ criterion with a C/I criterion in all FSS bands. The value of I/N needs further study, but CEPT considers that an increase from the current level of -12.2dB is justified. CEPT is also considering supporting the introduction of pfd levels in C and Ku bands which, if met, lead to a favourable finding under No. 11.32A. Dedicated pfd levels may need to be developed in order to protect certain existing systems with sensitive parameters. Further study is needed of the levels to be used. CEPT supports reducing the coordination arc between geostationary FSS networks to ±6° in C-band and to ±5° in Ku-band. Further study is needed in Ka band before a position can be adopted.

7.29 These issues continue to be discussed in the UK and no firm position has so far been agreed.

7.30 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk

Question 32: Do you have any comments on Agenda Item 9.1.2 concerning reduction of the satellite co-ordination arc?

Agenda Item 9.1, issue 9.1.3 - Use of satellite orbital positions and associated spectrum by developing countries

7.31 This item, explained within the related Resolution 11[57] (WRC-12), resolves:

(1) that the ITU-R continue to collaborate with, and provide information when requested by, ITU-D on satellite technologies and applications as defined in ITU-R Recommendations and Reports and on satellite regulatory procedures in the Radio Regulations that will help developing countries with the development and implementation of satellite networks and services;

(2) that ITU-R undertakes studies to determine whether it might be necessary to apply additional regulatory measures to enhance the availability of public mobile international telecommunication services delivered through satellite technology.

7.32 With regard to resolves 1, the UK recognises the needs of developing countries in the development and implementation of satellite networks and supports the call for collaboration between the ITU-D and ITU-R in order to exchange information that would aid developing countries with the development and implementation of satellite networks and services.

7.33 With regard to resolves 2 of Resolution 11 (WRC-12), no studies have so far been provided to the ITU-R that would enable the international community at large to:

i) understand the issues around the availability of public mobile international telecommunication services in developing countries; and

ii) study what regulatory actions could be proposed to alleviate these issues.

7.34 The UK satellite stakeholders have a direct interest in this issue, not least in terms of any proposals that could affect the current balance in the provisions of the Radio Regulations for access to orbital resources, e.g. Article 9 and/or Article 11. The UK is open to the studies under this issue, but is of the view that any proposal to change the provisions of the Radio Regulations in a way which gives coordination priority to certain satellite systems over any other satellite system should be opposed.

7.35 There is no CEPT position yet under this agenda item.

7.36 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk.

Question 33: Do you agree that the UK should oppose any proposal that aims at changing the provisions of the Radio Regulations in a way that gives inherent priority (i.e. coordination priority) to certain satellite systems over any other satellite system?

[57] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0001PDFE.pdf

Agenda Item 9.1, issue 9.1.4 – Updating the Radio Regulations (RRs)

7.1 This a standing item for all Conferences, namely to review the RRs for out of date or redundant material which is no longer required.

7.2 There is currently no CEPT or UK position. However the initial CEPT brief indicates a cautious approach as even historical information is often cross referred to in other documentation. There is a basic wish to avoid change unless absolutely necessary as it can take up valuable time during a Conference when priority should be given to the main agenda items.

7.3 If you would like to discuss this agenda item in more detail, Steve Ripley is co-ordinating the UK views and can be contacted by e-mail: Steve.Ripley@ofcom.org.uk

Question 34: Do you have any comments on Agenda Item 9.1.4 relating to updating the RR for out of date or redundant material?

Agenda Item 9.1, issue 9.1.5 - Satellite use of 3.4 – 4.2 GHz, for aeronautical and meteorological services

7.4 At WRC-12 it was highlighted that in some countries across Africa, where there is a lack of terrestrial infrastructure, satellite communications continue to play a critical role. This includes the satellite downlink band at 3.4 - 4.2 GHz which supports the movement of air traffic communications between air traffic management organisations. Additionally the use of the same band for the distribution of meteorological information was noted. This issue is limited to consideration by some countries in ITU Region 1 (i.e. Europe, Russia and Africa).

7.5 Use of fixed broadband wireless has been possible in parts of the 3.4 – 4.2 GHz band for a number of years. Additionally the band 3.4 – 3.6 GHz was identified for mobile use in a number of countries at WRC-07. As a result, this Agenda Item was agreed to look into what measures could be taken to support the on-going use of the frequency band by satellite earth station receivers. It also closely links with discussion under Agenda Item 1.1 where this band is expected to be a key area of focus.

7.6 The UK has been monitoring the studies and will contribute to the ongoing work as appropriate. However we feel that the case for any regulatory measures has not yet been made and that most of the issues identified should be addressed at a national level, or through bilateral or multi-lateral coordination. CEPT considers that regulatory procedures to address these issues are already contained in the Radio Regulations. Nevertheless, CEPT supports the development of regulatory measures (in the form of a Resolution) that urge relevant administrations in Region 1 to use special care in coordination, assignment and management of frequencies taking into account the potential impact on FSS earth station receivers.

7.7 If you would like to discuss this agenda item in more detail, James Richardson is co-ordinating the UK views and can be contacted by e-mail: James.Richardson@ofcom.org.uk

Question 35: Do you have any view on the need, or otherwise, for additional international regulatory measures to support the use of earth stations for aeronautical and meteorological communications in the 3.4 – 4.2 GHz band?

Agenda Item 9.1, issue 9.1.6 - Studies towards review of the definitions of fixed service, fixed station and mobile station

7.8 The purpose of this agenda item is to investigate the possible changing or updating of the Radio Regulations definitions of the fixed service, fixed station and mobile station.

7.9 This has been an on-going issue over several Conferences where many different points of view have been discussed without any outcome.

7.10 The CEPT position for WRC-15 is that there is no need for any change and the UK supports this approach. This is based on the fact that the coordination of large numbers of existing fixed/mobile stations with satellites and other terrestrial services are totally dependent on these definitions. Any change would require many new coordination procedures which would result in considerable risk and significant consequential activity.

7.11 If you would like to discuss this agenda item in more detail, Steve Ripley is co-ordinating the UK views and can be contacted by e-mail: Steve.Ripley@ofcom.org.uk.

Question 36: Do you agree that the UK should not support any change to the fixed and mobile definitions under Agenda Item 9.1.6?

Agenda Item 9.1, issue 9.1.7 - Spectrum management guidelines for emergency and disaster relief radiocommunication

7.12 This agenda item is to undertake the studies associated with the spectrum used for emergency and disaster relief communications. This includes the provision by the ITU of a spectrum database to assist with the choice of operational or inter-operational assistance during cross border incidents.

7.13 The ITU has established a list of focal points on a country by country basis within their existing database. Within the CEPT administrations there is already on-going cooperation in these areas and there is no wish to provide detailed operational information on a national basis to the ITU. All information requirements in an emergency are already available from the ITU listed contact points.

7.14 The emerging CEPT view is that no further work is required in this area, though no final position has been confirmed. There have been some CEPT discussions around the suppression of the relevant Resolution (647[58] Rev WRC-12), however this could mean a loss of the proposed database which CEPT feels needs to be retained. This item is linked to Agenda Item 1.3 (PPDR: Section 3) although this is a peripheral issue to that which is addressed under that agenda item. At the present time the UK does not have a developed position on this Agenda Item.

7.15 If you would like to discuss this agenda item in more detail, Steve Ripley is co-ordinating the UK views and can be contacted by e-mail: Steve.Ripley@ofcom.org.uk.

Question 37: Do you have any views on the CEPT position that no further work is required in respect of spectrum management guidelines for emergency and disaster relief radiocommunications?

[58] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0016PDFE.pdf

Agenda Item 9.1, issue 9.1.8 - Regulatory aspects for nano and pico-satellites

7.16 Under this agenda item work is examining the procedures for notifying space networks and considering possible modifications to enable the deployment and operation of nano and pico-satellites, taking into account their short development time, short mission time and unique orbital characteristics. The Director of the Radiocommunication Bureau will report to WRC-15 on the results of this work.

7.17 Recent system developer experiences have shown that the development, deployment and launch arrangement timelines for nano and pico-satellite systems may be much shorter than for traditional satellite systems. This creates a challenge for early identification of the mission specific orbital parameters to enable timely filing of information required for international coordination.

7.18 Furthermore, some nano and pico-satellites currently use spectrum allocated to the amateur satellite service and the MetSat[59] service although their missions are potentially inconsistent with these services.

7.19 Within the responsible ITU-R working party, a new draft report has been developed which addresses the current regulatory practice for nano and pico-satellites, and identifies the difficulties encountered in applying the RRs. This report is in response to the invitation to examine procedures for notifying space networks as called for in Resolution 757[60] (WRC-12).

7.20 The Resolution also resolves to invite WRC-18 to consider whether modifications to the regulatory procedures for notifying satellite networks are needed to facilitate the deployment and operation of nano and pico-satellites and to take the appropriate actions. This means that the current ITU studies on this issue, as reported to WRC-15, could form the basis of a new agenda item to WRC-18.

7.21 The ITU-R Special Committee Working Party (which addresses the regulatory and procedural aspects of the WRC agenda items) met in December 2013 and was of the view that special considerations for nano and pico-satellites did not appear justified, and advised that special provisions could result in unnecessary complications and wide ranging impacts. It considered that these kinds of satellites could continue to be regulated under the current approach and that a highly regulated regime would compromise the purpose of such satellites.

7.22 UK is of the view that no specific measures, such as changes to the satellite coordination and notification processes in the RRs, need to be taken in respect of nano and pico-satellites and that the existing approach to their regulation is considered sufficient.

7.23 If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk.

Question 38: Do you agree that no specific measures need to be introduced for nano and pico-satellites and that the current approach to their regulation is sufficient?

[59] MetSat: generic term for satellites used for the collection of meteorological data
[60] http://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000A0025PDFE.pdf

Agenda Item 9.2 - difficulties or inconsistencies encountered in the application of the Radio Regulations;

7.24 This part of the Director's Report summarizes the experiences of the Radiocommunication Bureau in administering the Radio Regulations, including difficulties and inconsistencies encountered in the application of the relevant provisions.

7.25 An initial version of this part of the Director's Report is normally made available shortly before the second session of the Conference Preparatory Meeting (CPM, to be held at the end of March 2015), with the final version made available between the CPM and the WRC. It can cover a very wide range of issues and contains the Bureau's suggestions for how these might be addressed. The Bureau cannot make formal proposals to the WRC, and so any suggestion made in this part of the Report needs to be supported by a proposal from at least one administration in order to be considered by the WRC.

7.26 Recently there have been discussions in CEPT concerning the applicability of footnote No. 5.526 in the Radio Regulations. Currently this footnote permits networks which operate in both in the fixed-satellite service (FSS) and the mobile-satellite service (MSS) to operate links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point or point-to-multipoint communications. That footnote applies to the bands 29.9 – 30 and 20.1 – 20.2 GHz globally, and to the band 29.5 – 30 and 19.7 – 20.2 GHz only in ITU Region 2.

7.27 In parallel the Radiocommunication Bureau (BR) has recently published a Circular Letter (Doc. CR/358[61]) through which a new Class of Station (code UC) has been created for an earth station while in motion, associated with a space station in the fixed-satellite service (FSS) in the bands listed under footnote 5.526.

7.28 The UK views these developments as positive for the operation of Earth Stations On Mobile Platforms (ESOMPs[62]). We consider that amending this footnote to apply to the FSS allocation in 29.5 - 30.0 GHz and 19.7 - 20.2 GHz in Regions 1 and 3, thereby aligning this with Region 2, would bring flexibility into the Radio Regulations whilst not increasing the potential for interference. The UK is therefore at this stage supportive of these proposals but will continue to monitor this situation as it develops.

7.29 The draft CEPT Brief includes this issue with a preliminary position supporting this proposed change.

7.30 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk

Question 39: Do you agree that the UK should support the recent regulatory developments with respect to ESOMP operation, while continuing to monitor developments?

[61] https://www.itu.int/md/dologin_md.asp?lang=en&id=R00-CR-CIR-0358!!MSW-E.
[62] ESOMPs – Earth Stations on Mobile Platforms: an application of the fixed-satellite service, where the earth station may operate from a single defined location, multiple points or whilst in motion.

Agenda Item 9.3 - on action in response to Resolution 80

7.31 Resolution 80, which links certain general provisions of the ITU Constitution and the Preamble with the coordination and notification procedures in the Radio Regulations, can prove very controversial. However, any such issues are likely to arise later in the preparatory process and possibly only at the conference itself. There has been little activity on this topic to date in the preparations for WRC-15 and no firm CEPT or UK position has so far emerged.

7.32 If you would like to discuss this agenda item in more detail, Tony Azzarelli is co-ordinating the UK views and can be contacted by e-mail: Tony.Azzarelli@ofcom.org.uk

Question 40: Do you have any comments on Agenda Item 9.3 considering Resolution 80?

Other standing Agenda items

7.33 The following standing agenda items will also be addressed later in the process:

2 ITU-R Recommendations incorporated by reference;
3 Consequential changes to the radio regulations;
4 Review of WRC Resolutions and Recommendations;
5 Report from the Radiocommunication Assembly;
6 Items requiring urgent action by the study groups.

7.34 These agenda items cover the housekeeping activities related to the Radio Regulations. For example when a recommendation which is referenced from the Radio Regulations has been updated, should the reference be to the old or new version. The purpose of these agenda items is to cover the areas where action may be needed but is not addressed in other areas. This is important, but is not normally a controversial exercise.

7.35 If you would like to discuss these standing agenda items in more detail please contact the following

For Agenda Items 2, 4 – Callum Gray is co-ordinating the UK views, email: Callum.Gray@ofcom.org.uk

For Agenda Items 3, 5, 6 – Stephen Talbot is co-ordinating the UK views, email: Stephen.Talbot@ofcom.org.uk

Question 41: Do you have any comments concerning the standing agenda items?

Section 8

Future WRC Agenda items

8.1 Discussions within CEPT are at a preliminary stage and no decisions have yet been made. Initial proposals for future agenda items within the CEPT are:

- Potential for IMT allocations above 6 GHz for 5G applications;
  Proposed by UK

- Upgrade of the secondary allocation to the EESS (space-to-Earth) by footnote RR 5.289 in the band 460 – 470 MHz to primary;
  Proposed by France and Germany.

- Harmonisation of 1 800 – 2 000 kHz in Region 1 to align with the Amateur service in Regions 2 and 3; allocation of 50 – 52 MHz to the amateur service and amateur satellite service in Region 1; harmonisation of amateur microwave sub-bands – notably 3 400 -3 410 MHz in Region 1 with Regions 2 and 3.
  These were proposed by the International Amateur Radio Union (IARU).

- To review the frequency bands between 6.5 and 57 GHz and consider additional spectrum allocations to the mobile service on a primary basis and identification of frequency bands, and related regulatory provisions, to facilitate the development of terrestrial mobile and fixed broadband applications;
  Proposed by Sweden

- To review the allocations in frequency bands between 1 427 – 5000 MHz in order to enable the development and introduction of new mobile and fixed wideband applications, and if necessary consider additional spectrum allocations;
  Proposed by Sweden

- To review the allocations in frequency bands below 694 MHz in order to enable the development and introduction of new mobile and fixed wideband applications, and if necessary consider additional spectrum allocations;
  Proposed by Sweden

- To consider a primary allocation to the mobile service in the frequency band 47 – 68 MHz;
  Proposed by Sweden

8.2 The UK supports the proposal for a WRC-18/19 agenda item to upgrade EESS 460 – 470 MHz to primary, recognising the need to have an appropriate pfd limit to protect terrestrial services and that data collection platforms shall not claim protection from fixed services and mobile services.

8.3 The proposal for further mobile allocations below 6 GHz overlaps with the on-going discussions related to WRC AI 1.1. Within CEPT, discussions on these proposals were postponed until after the international meeting that is addressing Agenda Item 1.1 (i.e. JTG 4-5-6-7) has finalised its work and when the regional positions for WRC-15 AI 1.1 are more defined.

Potential future Agenda Item for IMT above 6 GHz

8.4 The UK has submitted a proposal for IMT identification for bands above 6 GHz into the European process to facilitate industry developments in 5G technology. Our Mobile Data Strategy consultation and statement has highlighted support for this proposed agenda item, but it has also noted concerns, especially from the satellite community. Ofcom is aware of potential interest in a range of different spectrum bands that might be suitable for 5G technologies, including between 20 GHz and 50 GHz, 71 – 76 GHz & 81 – 86 GHz and more generally across the 40 GHz to 95 GHz range. Discussions are at a very early stage and we hope that this consultation provides an opportunity to gather views on potential 5G spectrum bands and associated technical compatibility studies that will need to be undertaken.

8.5 Recognising that this consultation document has a close date of 19th September Ofcom would be very pleased to receive early comments with respect to potential spectrum bands (for 5G) above 6 GHz. This is because of a relevant European meeting in early September (1st – 5th September). Early responses, on this point, will allow us time to consider those views, prior to that European meeting.

8.6 If you would like to discuss this agenda item in more detail, Wesley Milton is co-ordinating the UK views and can be contacted by e-mail: Wesley.Milton@ofcom.org.uk

Question 42: Do you have any comments regarding UK positions for future WRC agenda items?

Question 43: Are there any other possible agenda items you wish to see addressed by future WRCs?

Question 44: Are there particular frequency bands, above 6 GHz, that should be considered for technical study in relation to the potential future agenda item addressing IMT use?

Annex 1

Responding to this consultation

How to respond

A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5 pm on 19 September 2014**.

A1.2 Ofcom strongly prefers to receive responses using the online web form at http://stakeholders.ofcom.org.uk/consultations/wrc15/howtorespond/form, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email wrc-15@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Georgina Cowley
Floor 3
Strategy, International, Technology and Economics
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7981 3511

A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Stephen Talbot on 020 7783 4383.

Confidentiality

A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether

all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11 Following the end of the consultation period, Ofcom intends to publish a review of responses in Q4 2014.

A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.

A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Graham Howell, Secretary to the Corporation, who is Ofcom's consultation champion:

Graham Howell
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7981 3601

Email Graham.Howell@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.

A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing ☐ Name/contact details/job title ☐

Whole response ☐ Organisation ☐

Part of the response ☐ If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name Signed (if hard copy)

Annex 4

Consultation questions

Question 1: Do you have any comments on the mechanism for UK preparation for WRC-15 and the role of Ofcom in this process?

Question 2: Do you agree with the prioritisation of the agenda items, as shown in Annex 6, and if not why?

Question 3: Do you agree with Ofcom's general approach on WRC-15 agenda item 1.1?

Question 4: In view of the recent developments on the 1 492 - 1 518 MHz and 5 925 - 6 425 MHz bands, what are your views on the potential identification of these bands for IMT and/or RLAN and on the mobile data applications that could make use of them? How do you believe the sharing with the fixed service and the fixed satellite services could be managed at the national level?

Question 5: For the band 1 427 – 1 452 MHz, do you agree that it is right to support the further consideration of the band, recognising the Ministry of Defence interest?

Question 6: For the band 1 452 – 1 492 MHz, which is already subject to a harmonisation measure within CEPT, do you agree that this band be supported for an IMT identification at WRC-15?

Question 7: Recognising the UK plans to release spectrum in the 3 400 – 3 600 MHz band, coupled with the binding European Commission Decision (for electronic communications services) in the bands 3 400 – 3 600 MHz and 3 600 – 3800 MHz, do you agree that these bands should be supported for both a co-primary mobile allocation and IMT identification?

Question 8: Noting that there are a number of countries that strongly oppose the inclusions of the 3 800 – 4 200 MHz band, do you agree that we should support the longer term consideration of this band for potential mobile broadband use?

Question 9: Noting that there is currently limited international support for a co-primary mobile allocation in the band 2 700 – 2 900 MHz, do you think that we should continue to support this band at WRC-15?

Question 10: Do you agree that the 5 350 – 5 470 MHz and 5 725 – 5 925 MHz bands could provide important additional capacity for Wi-Fi and similar systems? If so, and noting the need to protect both earth observation satellites and radar systems, do you agree that sharing solutions should be considered at WRC-15?

Question 11: Do you agree that we should oppose a co-primary mobile allocation at WRC-15 for the band 470 – 694 MHz?

Question 12: Do you agree that the UK should continue to support harmonisation of 694 - 790 MHz for mobile broadband and an out-of-band emission limit for protection of DTT reception in an ITU-R Recommendation, alongside an acknowledgement that 694 MHz should be the lower frequency boundary for the band?

Question 13: Do you agree that any harmonisation measures for PPDR use should be sufficiently flexible to enable PPDR agencies to choose the most appropriate spectrum solutions nationally?

Question 14: Do you have any comments on the potential use by the amateur service in the 5 250 to 5 450 kHz band?

Question 15: Do you agree that if any allocations to the fixed satellite service in the 10-17 GHz range impose undue constraints on existing services then further studies on the demand and justification for use of the spectrum would need to be carried out?

Question 16: Do you agree that the UK should support retaining the recognition for aeronautical radionavigation use, but equally support reviewing the limits associated with the FSS with a view to facilitating better use by the FSS?

Question 17: Do you agree that the UK should support new primary allocations for the fixed-satellite service in the 7/8 GHz bands, with the proposed restrictions?

Question 18: Do you agree that the UK should not support new allocations for the mobile satellite service in 22-26 GHz as they are not justified and that the focus should instead be upon the continued protection of the incumbent services?

Question 19: What are your views on the use of FSS spectrum allocations for UAS, recognising the shared regulatory responsibility and the safety considerations for the control of unmanned aircraft?

Question 20: Do you have any view on the need, or otherwise, to modify the restrictions that relate to the operation of ESVs in the bands 5 925 – 6 425 MHz and 14-14.5 GHz?

Question 21: What are your views on a potential new allocation to the maritime mobile satellite service, recognising the UK interest in the other services that make use of the bands under consideration?

Question 22: Do you agree that the UK should not support a proposal for additional UHF spectrum for maritime on-board communications and that narrower channels will help to increase capacity?

Question 23: What are your views on any necessary regulatory provisions for AIS in the bands already identified for maritime use?

Question 24: Where the appropriate radio regulatory provisions are established for use in existing aviation related bands, do you agree that the UK should support regulatory conditions for the accommodation of WAIC applications?

Question 25: Do you agree that the UK should support a generic radiolocation allocation in the 77.5-78 GHz band, where appropriate technical conditions are established?

Question 26: Do you agree that the UK should support an allocation across the 7 190 – 7 250 MHz band, dependent upon the outcome of technical studies?

Question 27: Do you agree that is right to wait for the relevant sharing studies to mature before coming to a final position on the potential for additional allocations to the earth exploration-satellite (active) service in the 8/9/10 GHz band?

Question 28: Do you agree that the UK should support the CEPT position that removes the distance limitation on space vehicles communicating with orbiting manned space vehicles, whilst retaining the pfd limit to protect terrestrial services?

Question 29: Do you agree that the UK should support maintaining UTC as currently defined (i.e. with the inclusion of leap seconds) and that the UK should support further study around the concept of dissemination of two reference time scales?

Question 30: Do you have any comments on the UK approach and positions on the elements of Agenda Item 7?

Question 31: Do you agree that any potential regulatory constraints need to be fair and proportionate on both the Cospas-Sarsat operation and users in the adjacent band?

Question 32: Do you have any comments on Agenda Item 9.1.2 concerning reduction of the satellite co-ordination arc?

Question 33: Do you agree that the UK should oppose any proposal that aims at changing the provisions of the Radio Regulations in a way that gives inherent priority (i.e. coordination priority) to certain satellite systems over any other satellite system?

Question 34: Do you have any comments on Agenda Item 9.1.4 relating to updating the RR for out of date or redundant material?

Question 35: Do you have any view on the need, or otherwise, for additional international regulatory measures to support the use of earth stations for aeronautical and meteorological communications in the 3.4 – 4.2 GHz band?

Question 36: Do you agree that the UK should not support any change to the fixed and mobile definitions under Agenda Item 9.1.6?

Question 37: Do you have any views on the CEPT position that no further work is required in respect of spectrum management guidelines for emergency and disaster relief radiocommunications?

Question 38: Do you agree that no specific measures need to be introduced for nano and pico-satellites and that the current approach to their regulation is sufficient?

Question 39: Do you agree that the UK should support the recent regulatory developments with respect to ESOMP operation, while continuing to monitor developments?

Question 40: Do you have any comments on Agenda Item 9.3 considering Resolution 80?

Question 41: Do you have any comments concerning the standing agenda items?

Question 42: Do you have any comments regarding UK positions for future WRC agenda items?

Question 43: Are there any other possible agenda items you wish to see addressed by future WRCs?

Question 44: Are there particular frequency bands, above 6 GHz, that should be considered for technical study in relation to the potential future agenda item addressing IMT use?

Annex 5

Impact Assessment

A5.1 There is not sufficient information available to conduct a full impact assessment at this time. At this stage of WRC preparation the technical studies which provide the background to regulatory decisions are mostly incomplete and the views of both the UK and other countries are subject to change.

A5.2 The descriptions of individual agenda items include information on the potential impact to UK interests, where these are known.

Annex 6

Agenda of WRC-15

A6.1 The full Agenda for WRC-15 is shown below. In addition we have added, in the final column, an indication of the priority that we anticipate giving to each Agenda Item. A description of how the priorities have been assessed by Ofcom, including a definition of high, medium and low, is included after the table.

WRC-15 Agenda Item	Title	Current UK priority
1	on the basis of proposals from administrations, taking account of the results of WRC-15 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:	N/A
1.1	to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC-15)**;	High
1.2	to examine the results of ITU-R studies, in accordance with Resolution **232 (WRC-15)**, on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;	High
1.3	to review and revise Resolution **646 (Rev.WRC-15)** for broadband public protection and disaster relief (PPDR), in accordance with Resolution **648 (WRC-15)**;	High
1.4	to consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with Resolution **649 (WRC-15)**;	Low
1.5	to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with Resolution **153 (WRC-15)**;	Medium
1.6	to consider possible additional primary allocations:	
1.6.1	to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;	Medium
1.6.2	to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz;	Low
	and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with Resolutions **151 (WRC-15)** and **152 (WRC-15)**, respectively;	
1.7	to review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with Resolution **114 (Rev.WRC-15)**;	Low
1.8	to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with Resolution **909 (WRC-15)**;	Low
1.9	to consider, in accordance with Resolution **758 (WRC-15)**:	
1.9.1	possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions;	Medium
1.9.2	the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the	Medium

	maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;	
1.10	to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with Resolution **234 (WRC-15)**;	Medium
1.11	to consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with Resolution **650 (WRC-15)**;	Medium
1.12	to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with Resolution **651 (WRC-15)**;	Medium
1.13	to review No. **5.268** with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with Resolution **652 (WRC-15)**;	Low
1.14	to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with Resolution **653 (WRC-15)**;	High
1.15	to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with Resolution **358 (WRC-15)**;	Medium
1.16	to consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with Resolution **360 (WRC-15)**;	Medium
1.17	to consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with Resolution **423 (WRC-15)**;	Medium
1.18	to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution **654 (WRC-15)**;	Medium
2	to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-15)**;	Low
3	to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;	Low
4	in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;	Low
5	to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;	Low
6	to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;	Low
7	to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)** to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;	Medium

8	to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;		Low
9	to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:		
	9.1	on the activities of the Radiocommunication Sector since WRC-12;	
	9.1.1	Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz	Medium
	9.1.2	Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7	Medium
	9.1.3	Use of satellite orbital positions and associated frequency spectrum to deliver international public telecommunication services in developing countries	Low
	9.1.4	Updating and rearrangement of the Radio Regulations	Low
	9.1.5	Consideration of technical and regulatory actions in order to support existing and future operation of fixed satellite service earth stations within the band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1	Low
	9.1.6	Studies towards review of the definitions of fixed service, fixed station and mobile station	Medium
	9.1.7	Spectrum management guidelines for emergency and disaster relief radiocommunication	Low
	9.1.8	Regulatory aspects for nano and pico-satellites	Medium
	9.2	on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and	Low
	9.3	on action in response to Resolution **80 (Rev.WRC-07)**;	Low
10	to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.		High

Annex 7

UK Co-ordinators for WRC-15

A7.1 The following table shows the UK co-ordinators for WRC-15 agenda items.

Agenda Item No.	UK Co-ordinator	e-mail
1.1, 1.2	Steve Green	Steve.Green@ofcom.org.uk
1.3	Andrew Gowans	Andrew.Gowans@ofcom.org.uk
1.4, 1.15, 1.16	Steven Alexander	Steven.Alexander@ofcom.org.uk
3, 5, 6	Stephen Talbot	Stephen.Talbot@ofcom.org.uk
1.18	Robin Donoghue	Robin.Donoghue@ofcom.org.uk
1.6, 1.8, 9.1.5	James Richardson	James.Richardson@ofcom.org.uk
1.7, 7, 9.1.2, 9.1.3, 9.2, 9.3	Tony Azzarelli	Tony.Azzarelli@ofcom.org.uk
1.9, 1.11, 1.12, 1.13, 9.1.8	Bharat Dudhia	Bharat.Dudhia@ofcom.org.uk
1.10, 9.1.1	John Rogers	John.Rogers@ofcom.org.uk
1.14	Robert Gunn	Robert.Gunn@nmo.gov.uk
2, 4	Callum Gray	Callum.Gray@ofcom.org.uk
1.5, 1.17	Stephen Limb	Stephen.Limb@ofcom.org.uk
9.1.4, 9.1.6, 9.1.7	Steve Ripley	Steve.Ripley@ofcom.org.uk
8, 10	Wesley Milton	Wesley.Milton@ofcom.org.uk

Annex 8

Timeline of key events

A8.1 The following table shows some of the key meetings and important dates from June 2014 related to WRC-15 where Ofcom, in its role as UK representative, plans to participate and contribute.

Date	Event	Description
10th – 13th June 2014	Asia Pacific Telecommunications	Regional Preparatory Group
21st – 31st July 2014	Joint Task Group 4-5-6-7 (Final)	International group for AIs 1.1 and 1.2
15th August 2014	CPM Text deadline	Deadline for text to be incorporated into the CPM Report to WRC-15
23rd – 26th Sept. 2014	Conference Preparatory Group (CPG)	European: CEPT
2nd – 6th Feb 2015	Conference Preparatory Group (CPG)	European: CEPT
23rd Mar to 2nd Apr 2015	Conference Preparatory Meeting	Agreement of conference preparatory report
June 2015	Conference Preparatory Group (CPG)	European: CEPT Approval and agreement on 1st set of ECPs
Sept 2015	Conference Preparatory Group (CPG)	European: CEPT Agreement on remaining ECPs
26th – 30th Oct. 2015	Radio Assembly 15	Radiocommunication Assembly
2nd – 27th Nov. 2015	WRC-15	World Radiocommunication Conference

Annex 9

Glossary of terms

3GPP	3rd Generation Partnership Project. Collaboration between groups of telecommunications associations, to make a globally applicable third-generation (3G) mobile phone system specification within the scope of the International Mobile Telecommunications-2000 project of the International Telecommunication Union (ITU)
Administration(s)	term used to indicate a counties governmental department or organisation representative, that is able discharge a countries obligations/activities in the International Telecommunications Union (ITU).
AIS	Automatic Identification System. a broadcast transponder system operating in the VHF maritime mobile frequency band. It is capable of sending ship's navigation information to other ships and to shore.
AM(R)S	Aeronautical Mobile (Route) Service
AMS(R)S	Aeronautical Mobile-Satellite (Route) Service
APG	Asia-Pacific Telecommunity Conference Preparatory Group. The sub-group of the Regional Group covering the Asia-Pacific region which prepares positions and proposals for the WRC
API	Advance Publication Information: a set of initial data about a proposed satellite network published on the BR IFIC
ARNS	Aeronautical Radionavigation Service
ASMG	Arab Spectrum Management Group. The Regional group covering the 22 Arab countries in North Africa and the Middle East
ATU	African Telecommunication Union. The Regional group preparing African positions and proposals for the WRC
BR IFIC	International Frequency Information Circular of the Radiocommunication Bureau of the ITU published every two weeks
CAA	Civil Aviation Authority
CEPT	European Conference of Postal and Telecommunications Administrations
CITEL	Inter-American Telecommunication Commission. The Regional group which prepares common proposals for the WRC for Region 2 of the ITU (North, Central and South America)
CNPC	control and non-payload communications: communications links through which an unmanned body is controlled
CPM	Conference Preparatory Meeting. The ITU meeting which produces a Report to the WRC explaining the background and the various methods proposed to resolve the agenda items
DTH	Direct-to-home
DTT	Digital Terrestrial Television: broadcasting delivered by digital means. In the UK and Europe, DTT transmissions use the DVB-T and DVB-T2 technical standards

e.i.r.p.	equivalent isotropically radiated power. The product of the power supplied to the antenna and the antenna gain relative to an isotropic antenna
ECC	Electronic Communications Committee. The highest level spectrum policy body in the CEPT
ECP	European Common Proposal. A proposal for the WRC supported by a certain number of CEPT countries
EESS	Earth Exploration Satellite Service
e-navigation	An IMO strategic vision to integrate existing and new maritime navigational tools, in particular electronic tools, in an all-embracing system that will contribute to enhanced navigational safety for the maritime sector.
ESA	European Space Agency
ESOMP	Earth Station on-board a Moving Platform
ESV	Earth Station on-board a Vessel
EVA	extra-vehicular activity: activity in close proximity to an orbiting spacecraft
FSS	Fixed-Satellite Service
GMDSS	Global Maritime Distress and Safety System
GMT	Greenwich Mean Time. Mean solar time at the prime meridian (0° longitude)
GSO	Geostationary-Satellite Orbit. an orbit in the plane of the Equator at an altitude of 35786km. A satellite placed in this orbit revolves around the same axis about which the earth rotates and its orbital period is 24 hours and thus it appears stationary in the sky to an observer on the earth
ICAO	International Civil Aviation Organisation: a specialised agency of the United Nations dealing with civil aviation matters
IFPG	International Frequency Planning Group: the committee which agrees the UK position for the WRC. Membership is limited to government and relevant regulatory bodies
IMO	International Maritime Organisation: a specialised agency of the United Nations dealing with maritime matters
IMT	International Mobile Telecommunications: the ITU term that encompasses 3G, 4G and 5G wireless broadband systems
IPTV	Internet Protocol Television: the term used for television and/or video signals that are delivered to subscribers or viewers using Internet Protocol (IP)
ITU	International Telecommunication Union: a specialised agency of the United Nations, consisting of 193 Member States and over 700 private-sector entities academic institutions, headquartered in Geneva
ITU-D	The Telecommunication Development Sector of the ITU
ITU-R	The Radiocommunication Sector of the ITU
JTG 4-5-6-7	Joint Task Group of Study Groups 4, 5, 6 and 7 of the ITU-R: the ITU-R group responsible for conducting studies relevant to Agenda Items 1.1 and 1.2 of WRC-15
L-band	a range of frequencies between about 960 and 1800MHz

LTE	Long Term Evolution is a standard for communication of high-speed data for mobile phones and data terminals. The term 4G is generally used to refer to mobile broadband services delivered using the next generation of mobile broadband technologies, including Long Term Evolution (LTE) and WiMAX
MetSat	Meteorological-Satellite Service
MLS	microwave landing system
MMSS	Maritime Mobile-Satellite Service
MSS	Mobile-Satellite Service
Nano-satellite	a small satellite of the order of less than 1m x 1m x 1m
PFD	power flux density: radiated power passing through a given area
Pico-satellite	a very small satellite of the order of 10cm x 10cm x 10cm
PMSE	Programme Making and Special Events: radio applications that support a wide range of activities in entertainment, broadcasting, news gathering and community events.
PPDR	Public Protection and Disaster Relief: includes emergency services such as the police, fire brigade and ambulance.
Radio Regulations or RRs	International regulations governing the use of radio spectrum and satellite orbits. Together with the Telecommunications Regulations and the Constitution and Convention of the ITU, they form an intergovernmental treaty to which ITU Member States bind themselves
RCC	Regional Commonwealth in the field of Communications. The Regional group comprising the Russian Federation and the Commonwealth of Independent States
RLAN	Radio Local Area Network
RRB	Radio Regulations Board
SOS	Space Operations service
SRS	Space Research Service
TAI	International Atomic Time: a high-precision atomic coordinated time standard. It is the basis for Coordinated Universal Time (UTC). TAI as a time scale is a weighted average of the time kept by over 200 atomic clocks in over 50 national laboratories worldwide
TT&C	Telemetry, Tracking and Control: links between an earth station and a satellite through which the orbit and operation of the satellite are controlled
UA	Unmanned Aircraft: an aircraft which has no pilot on-board
UAS	Unmanned Aircraft System: a communications system comprising a unmanned aircraft control station (UACS) on the ground and an unmanned aircraft
UHF	Ultra-High Frequency: the range of frequencies between 300MHz and 3GHz
UKSSC	UK Spectrum Strategy Committee. Government committee responsible for cross-government spectrum management, including signing off the final UK positions for the WRC

UTC	Coordinated Universal Time: time scale in seconds as defined in ITU Recommendation TF.460-6
VDES	VHF Data Exchange System
VSAT	Very Small Aperture Terminal
WAIC	Wireless Aircraft Intra-Communications
WRC	World Radiocommunication Conference. A meeting of the ITU-R, held approximately every 4 years, which has the authority to partially or completely revise the Radio Regulations according to a predefined agenda