



WRC-12

Summary of responses to the WRC-12 Consultation

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Section 1

Introduction

This document provides a summary of the results of the Ofcom consultation on WRC-12 conducted between 16 November 2009 and 5 February 2010.

WRC preparation is an ongoing process and definitive UK positions are not taken until the submission of proposals to the conference, it would therefore be premature for Ofcom to issue a statement directly following this consultation. This document is intended to inform the on-going preparation process. It provides an analysis of the comments received and Ofcom's response.

This document will be considered by the International Frequency Policy Group (IFPG), the Ofcom committee responsible for UK preparations for the WRC, as part of the process to develop UK positions. The final agreement of these positions, and associated UK proposals, is ultimately the responsibility of HM Government.

Section 2

General issues

Question 1: Are there any opportunities or threats associated with WRC-12 in addition to those already identified in this consultation? Do you agree with the prioritisation of the agenda items, and if you have identified any opportunities or threats, does this have an impact on these priorities?

Issue raised	Comments	Ofcom response
Priorities	<p>The majority of responses supported the priorities given.</p> <p>Intelsat stated that they would accord high priority to agenda items 7 and 8.1.3, and medium-to-high priority to agenda items 1.13 and 1.20.</p> <p>SES stated that Ofcom should raise the priority of agenda item 7 explaining that this has serious implications for the satellite industry. SES also requested Ofcom to raise the priority for agenda item 1.13 pointing out the possibility that solutions to this agenda item could set a dangerous precedent in other bands.</p>	<p>The priority given to individual agenda items provides a guide to Ofcom on the level of engagement needed.</p> <p>The list of priorities is kept under review and the comments received will be discussed by the IFPG.</p>
Opportunities or threats	<p>There was broad agreement with the opportunities or threats identified.</p> <p>The BBC expressed its concern that there should be no further re-allocation in the UHF Television bands, explaining that the entire spectrum is needed to develop digital TV and allow for PMSE to operate in the white spaces.</p> <p>Inmarsat described the opportunities and threats to their operations from agenda items 1.2, 1.3, 1.7, 1.20, 1.25 and 7.</p> <p>SkyTerra identified a significant threat if the current UK position on agenda item 1.7 were not maintained.</p>	<p>Ofcom recognises that any changes to the allocations used for UHF Television would be controversial and would only be considered following further detailed consultation.</p> <p>Ofcom notes the comments from Inmarsat and SkyTerra. The information presented is considered in more detail later in this document.</p>
UK Delegation to WRC	<p>Vodafone explained the importance attached to WRCs by many countries, pointing out the US Delegation is led by an Ambassador. For the UK to achieve its objectives, the senior members of the UK delegation need to have the standing to participate effectively in these negotiations.</p>	<p>The UK Delegation to WRC will be led by Ofcom's Director of International Spectrum Policy supported by a team of Ofcom's most experienced staff in WRC matters and highly experienced stakeholders.</p>

Question 2: Do you have any comments on the mechanism for UK preparation for WRCs and the role of Ofcom in this process?

Issue raised	Comments	Ofcom response
Ofcom preparatory process	<p>The RSGB, BT, SkyTerra and Orange were all broadly supportive of the Ofcom approach.</p> <p>The BBC welcomed the regular meetings of the IFPG, but highlighted that there had been no UK ITU-R meetings since 2008.</p> <p>Inmarsat provided a number of detailed comments which are reproduced in full:</p> <ul style="list-style-type: none"> • <u>“Use of the UK ITU-R and CEPT preparatory groups</u> <p>Once the agenda for a WRC is established by the preceding WRC, the work associated with each agenda item usually runs from that time up to the following WRC where the agenda item is considered. This is typically a 3-4 year period.</p> <p>For most agenda items, and particularly in the early stages, detailed technical work is required to evaluate the feasibility of making the proposed changes to the Radio Regulations. Such technical work is typically submitted in contributions to the ITU-R working parties and CEPT project teams for discussion and hopefully agreement. Proposed UK contributions to the ITU-R working parties and CEPT project teams are typically discussed and approved in the UK preparatory groups (UK SG4, UK WP4C, etc). During this period, it is usually unnecessary for the UK to establish a firm position on an agenda item, and Ofcom should be prepared to let the technical and/or regulatory studies take their course. All UK stakeholders should have the opportunity and examine and discuss any proposed UK contributions to the ITU-R and CEPT working groups.</p> <p>Later in the process, when the technical/regulatory work is reaching maturity, it is usually necessary for the UK to establish a firm position on an agenda item. At this time, it is necessary that all stakeholders have the opportunity to contribute and discuss the proposals and options in an open environment.</p> <p>In our experience, the ideal approach outlined above has not always taken</p>	<p>Ofcom welcomes the level of detail of the responses to this question.</p> <p>It should be noted that some changes were made to the UK briefing arrangements during this consultation. Although the main preparatory process for WRC is unchanged, physical meetings of the UK ITU-R have been merged into the new International Spectrum Stakeholder Briefing. The IFPG continues to be the primary working level mechanism for co-ordinating UK positions on WRC agenda items</p> <p>The early stages of work on WRC agenda items often require detailed technical work. Ofcom notes that CEPT project teams and ITU-R working parties are open to industry and stakeholders can participate in this work. Nonetheless Ofcom recognises that not all stakeholders have the resources to attend CEPT and ITU-R meetings and we will endeavour to keep UK stakeholders updated with developments.</p> <p>Ofcom recognises that some stakeholders prefer their contributions to CEPT and ITU-R to be submitted as UK contributions. Ofcom will continue to ensure that such contributions to international organisations are consistent with our policies on spectrum use and aim to achieve progress in a constructive and efficient manner.</p>

	<p>place in three aspects:</p> <ul style="list-style-type: none"> - Firstly, on occasions Ofcom has not been prepared to let the technical work run its course before coming to a position on the feasibility of a change to the Radio Regulations. Consequently, a position may be determined based on incomplete or incorrect information. Where there are differing views among the UK stakeholders, it is important to allow the technical and/or regulatory studies to take place and to avoid jumping to a position prematurely. - Secondly, there is sometimes a reluctance to allow a UK submission to an ITU-R or CEPT group in case this is interpreted by others as UK support for a particular service above another. This fear is, we believe, unfounded and is one which other administrations in the ITU-R and CEPT do not appear to share. Taking this approach unnecessarily constrains the ability of UK stakeholders to contribute to the work in ITU-R and CEPT. - Thirdly, sometimes Ofcom has set a UK position without first having an open discussion with all the stakeholders. It is important that discussion on all agenda items takes place in an open environment where frank discussion can take place. This would normally mean face-to-face meetings within the UK preparatory groups. We have seen on several occasions where Ofcom has unilaterally determined the "UK position" without listening to all stakeholders. We would accept that there are sometimes irreconcilable differences of opinion between stakeholders and hence Ofcom may have to arbitrate. However there have been occasions where the "UK position" has been set by Ofcom unilaterally, without discussion involving stakeholders. <p>In our view, Ofcom should keep a more open mind at the early stages of the work. Furthermore, Ofcom should be more willing to accept proposed UK contributions to the CEPT and ITU-R groups on sharing aspects from stakeholders and should ensure that opportunity for open and frank discussion exists for all issues. Where there are no conflicting views among the UK stakeholders, Ofcom should also consider allowing the stakeholder to act as lead UK spokesperson on that</p>	
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	<p>issue.”</p> <p>Intelsat noted with concern a trend in recent years for Ofcom to adopt UK positions based more on views within Ofcom and less on stakeholder representations.</p> <p>SES recommended Ofcom to make the UK WRC preparation process more regular and predictable, with improved transparency. SES provided the following suggestions to improve the process:</p> <ul style="list-style-type: none"> • Create of a list of Ofcom co-ordinators responsible for WRC Agenda items. This list should be publicly available on the Ofcom website. • SES recommends that Ofcom set up an e-mail list for each Agenda item. Information on how to join each list should be posted on the Ofcom website. Currently correspondence with interested parties is organised via an e-mail list controlled by the co-ordinator of the agenda item. This makes it difficult for interested parties less familiar with the process to become involved. Names often drop off the circulation lists. • Members of an e-mail list should receive all information relating to meetings that consider that particular Agenda item. This should include the relevant ITU and other governmental or inter-governmental groups (for instance, the European Conference of Post and Telecommunications “CEPT”), and any other preparatory groups in which Ofcom participates. • The co-ordinator for the Agenda item should communicate with the members of the e-mail list and provide them with a draft of the UK position and other information three weeks prior to any meeting where a particular WRC Agenda item will be discussed. If a position or information is unavailable, the co-ordinator should provide reasons why such information is not available and the date on which it will become available. • Where the co-ordinator does not plan to hold a face-to-face meeting an opportunity should be provided to allow members of the e-mail list 	<p>Ofcom welcomes the specific proposals to improve the WRC preparation process. Our comments are given alongside each proposal:</p> <p>Ofcom agrees that it would be useful to make additional information available on the Ofcom website related to WRC-12, this will include the list of co-ordinators.</p> <p>Ofcom is rationalising its management of e-mail lists as part of an exercise to resolve the problems which have occurred, for example members dropping off lists. These e-mail lists will remain under the control of the co-ordinator with recipients receiving blind copies in order to meet data protection requirements.</p> <p>Ofcom will endeavour to supply relevant information to stakeholders, however we do not consider that the best use of our limited resources is to re-distribute information which is already in the public domain.</p> <p>The Ofcom view is that this is unlikely to be feasible in practice. It is rare that the input contributions are available in this timeframe for most CEPT and ITU meetings. Looking at the broad nature of WRC agenda items, Ofcom prefers to avoid a rigid one size fits all approach to stakeholder consultation.</p> <p>Ofcom will make best efforts to meet with stakeholders when necessary.</p>
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	<p>to request such a meeting to better enable industry input. Where three interested parties request a meeting, Ofcom should make best efforts to organise such a meeting.</p> <ul style="list-style-type: none"> • We recommend that Ofcom publish a document setting out the process by which the UK positions for WRCs are developed. This information should be available on the Ofcom website. • When developing positions on WRC Agenda items, the co-ordinator frequently discusses the matter with colleagues within Ofcom. Parties interested in particular matters are not always provided information pertaining to the outcome of these discussions. Moreover, they are not always informed regarding how such discussions influence the UK positions. This approach makes it difficult to contribute adequately to the WRC preparation process and to fully discuss and contribute to the UK position, as the evidence used in these meetings is not available for review and comment. We believe that additional transparency that allows industry access to the results of internal discussions which materially affect the development of any UK position is required. <p>Vodafone supported the preparation process, but feels that Ofcom does not always take full advantage of the experience of stakeholders.</p>	<p>This will be done as part of the process in which we are aiming to make more information on WRC available.</p> <p>Ofcom will explain the justification for decisions taken and the evidence used to support such discussions where appropriate.</p> <p>Ofcom appreciates that some stakeholders have considerable experience at WRCs. Ofcom is open to discuss ways to make better use of this resource.</p>
UK SSC	<p>Inmarsat and SkyTerra commented that the UK SSC is not open to industry and that this group should work in a more transparent way.</p>	<p>The UK SSC is the Cabinet Office committee which determines Government policy on spectrum, Ofcom does not determine the working methods for this committee.</p> <p>The only issue addressed in detail so far by the UK SSC is agenda item 1.7. The history of agenda item 1.7 and the UK position on the subject of this agenda item concerns the CAA directly and Ofcom needed confirmation of the agreed UK Government view early in the WRC process.</p>
Public consultation	<p>Inmarsat offered some observations on the use of public consultations and the idea that it might be appropriate to consider having two consultations: the first soon after the WRC agenda is</p>	<p>Ofcom can see value in having a two stage consultation. In particular, an early consultation would help identify interested stakeholders and set priorities for the work. It will be necessary to review the</p>

	agreed, and the second later in the process when the studies are more mature and national positions need to be determined.	overall WRC process in 2012 and assess the best way to proceed. The agenda of the next WRC will obviously influence this decision.
<i>General policy</i>	<p>Inmarsat suggested a review of Ofcom's general policies and how they applied to specific agenda items, giving 1.2 and 1.25 as examples of agenda items where general policies were not applied consistently.</p> <p>Inmarsat and Intellect recommended that industrial policy should be taken into account in the formulation of UK positions.</p>	<p>These issues are discussed in more detail later in this document.</p> <p>Ofcom's duties are defined by the Communications Act 2003 and other relevant legislation. Ofcom's primary duties are to further the interests of citizens in relation to communications matters, and to further the interests of consumers in relevant markets, where appropriate by promoting competition.</p>

Question 3: Do you agree with Ofcom's view that WRC-12 does not have direct implications for equality or diversity of UK citizens?

Issues raised	Comments	Ofcom response
Equality or diversity	All responses agreed with the Ofcom view. SES pointed out that satellite communications have the ability to reach all citizens regardless of how rural or remote their location. Orange pointed out WRC-12 decisions may impact the ability of mobile operators to roll out services to rural areas.	Ofcom notes the general agreement here.

Section 3

Comments on the WRC agenda items

Agenda Item 1.2 (16 respondents (RSGB, 02, BT, T-Mobile, Vodafone, Intellect, Cable and Wireless, BBC, ESOA (Supported by SAP REG) Intelsat, Inmarsat, SES, ESA, Avanti, Paradigm)

Question 25: What are your views on the need to introduce greater flexibility in the international regulatory framework and on Ofcom's approach to agenda item 1.2?

Issue Raised	Comments	Ofcom response
Ofcom's approach to this agenda item	<p>Most respondents support the introduction of greater flexibility in the Radio Regulations. Additionally, most felt that this should be implemented with care so that impact to existing services and users are thoroughly assessed before any changes are implemented.</p> <p>Vodafone further notes that it is often not the regulations themselves that lack flexibility, but the interpretation of them by individual countries. It is important to focus on changes to the Radio Regulations that:</p> <ul style="list-style-type: none"> - have a practical benefit, - do not have significant consequential impact on existing allocations and assignments, and - do not just move bureaucracy and regulatory constraints elsewhere. <p>It also noted with disappointment the lack of progress made under this agenda item since initiation in WRC-03.</p>	<p>Ofcom believes that the Radio Regulations should be kept under review to ensure they remain relevant to accommodate the rapid evolution of technologies and this forms the main objective of this agenda item.</p> <p>Ofcom notes that whilst progress has been slow in the ITU, there has been considerable progress in the EU to provide a more flexible framework for spectrum management.</p> <p>Ofcom notes the general support for pursuing greater flexibility in the Radio Regulations and agrees that any changes proposed should have a practical benefit and add real value. Our current approach is therefore to consider specific areas/issues in more detail rather than to pursue a major overhaul of the Radio Regulations in one go, which may create uncertainty to existing services. We recognize that this approach may be perceived as a lack of progress in some areas; however, we believe that a focussed approach is more likely to achieve practical objectives.</p> <p>In pursuing these objectives, we believe the most appropriate place to initiate change is within the ITU-R study process itself (ITU-R Study Groups either for WRC or non WRC issues) where a more collective objective is required to seek outcomes that do not recommend overly restrictive / unnecessary constraints for radio services, particularly when considering the balance between the introduction of new applications and the protection to existing services.</p> <p>While the ITU-R SG process is key to achieving this progress, we believe a</p>

		useful outcome of the WRC-12 agenda item would be to set some principles (possibly through a WRC Resolution) to evolve towards the path of greater flexibility whilst applying the implementation of such principles on a case by case basis.
Keeping the current practice	<p>SES and Avanti stated that the existing practice - where agenda items are established by one WRC to address specific matters and then resolved at the following WRC - is sufficiently flexible to meet the needs of new and innovative services or applications.</p> <p>Avanti further believes that Ofcom's policy orientation which it perceives as being to force through greater flexibility in the Radio Regulations is seriously misplaced and harmful to various sectors of the wireless industry which seeks stable ITU harmonisation measures valid at a global or ITU regional level for certain categories of radio services (such as satellite services). No further action is required to promote 'flexibility' internationally in ITU or CEPT or EU. Flexibility could be implemented at a national level with the appropriate consultation.</p>	<p>As indicated above, Ofcom believes that a pragmatic approach to assessing the introduction of greater flexibility is required.</p> <p>Ofcom does not agree that promoting flexibility is solely a national issue. For example, approaches to developing least restrictive technical conditions under the WAPECS opinion (flexible spectrum management) principles and implemented in selective frequency bands have been beneficial in achieving harmonised flexible access conditions for electronic communication services in European markets. This benefit would not have been achieved with a national only approach. We do however recognise the form of flexibility required is not necessarily the same at the different levels (national, regional, ITU).</p>
Convergence in fixed and mobile services – General comments and changes to fixed and mobile service definition	<p>RSGB felt that fixed and mobile convergence needs to be done with careful consideration and implementation needs to be done on a case by case basis.</p> <p>BT believes that the rapid evolution of technologies and convergence, whereby the same technology can be used in several applications that fall within different ITU radiocommunication service categories needs to be recognized within the regulations. The distinction between the Fixed and Mobile Services can be somewhat arbitrary. If frequency bands are not allocated to both services this could give rise to uncertainty, particularly if both fixed and mobile terminals are served within the same network.</p> <p>On the other hand, SES disagreed that the convergence of technologies and services has rendered historical service definitions obsolete and therefore require change to the ITU RR. It further noted that inconsistencies and overlap between the existing fixed and mobile service definitions illustrates that there is flexibility in the current definitions to accommodate</p>	<p>One issue that is being widely recognised is that the distinction between certain fixed and mobile applications in certain frequency bands is becoming increasingly less obvious.</p> <p>We believe that convergence at the application level does not necessarily imply the need to have a converged service definition in the Radio Regulations. Service definitions in the Radio Regulations tend to imply certain similar technical and operational characteristics of the radio service. However, we recognise that in practice this may not be the case for emerging technologies and applications, where the same radio service can have different technical and operational characteristics in different bands.</p> <p>However, to accommodate converged applications that could operate under both fixed and mobile allocations in some bands, Ofcom's view is that a joint allocation to both services is sufficient in those bands. We believe this allows sufficient flexibility, without limiting one or the other service and allows</p>

	<p>new originally unforeseen applications within the existing fixed satellite service definition (e.g., earth stations on board vessels.) Administrative difficulties in determining under which service category (fixed or mobile) a Wireless Broadband Services belongs to does not necessitate change to the service definition. The mobile service already provides for complete flexibility.</p> <p>A few respondents noted that the current definitions in the Radio Regulations have been well established and had conferred certainty in the access to spectrum to allow operation free from harmful interference. Allocations in Article 5 of the Radio Regulations are made based on service definitions and generally based on compatible radio services. In those cases where services that are incompatible with each other have been allocated the same band, the tendency has been either for one of the services to develop to a much greater extent than the other or for the two services to develop only in separate geographical areas.</p> <p>Hence any changes in the service definitions require thorough study to avoid unintended consequences.</p>	<p>Administrations and the wider market to determine the most appropriate use of a given band. In addition studies carried out in the ITU-R have already shown that a joint allocation of the fixed and mobile service at the same level (i.e. primary, secondary) is already the case in most bands. Any proposals for new allocations would have to be assessed on a case by case basis.</p>
<p>Convergence in fixed and mobile services - concern on impact of merging fixed and mobile service on satellite</p>	<p>Several respondents indicated that merging fixed and mobile service (or removing the distinction between fixed and mobile service) would result in loss of flexibility and efficiency of spectrum use. One respondent was of the view that Ofcom has been promoting such a merge. In particular, respondents further noted that sharing between fixed satellite service and fixed service (point-to-point fixed links) in the same band has been enabled by the use of highly directional antennas and the fact that stations operating at specified fixed points could be coordinated easily. Such a change to the service definition will increase the risk of interference to satellite services, restrict the ability to share and may lead to complex/impossible coordination scenarios.</p> <p>SES further noted that changes that could significantly affect the sharing feasibility in a given frequency band (e.g., frequency bands where only a fixed service allocation currently exists) should be addressed on a case-by-case basis through specific WRC agenda items,</p>	<p>For the reasons given above, Ofcom is not in favour of merging the fixed and mobile service definitions.</p> <p>Our position on any proposals relating to fixed and mobile convergence would be guided by the following principles:</p> <ul style="list-style-type: none"> - any changes to service definitions would have to be done with extreme care to avoid any unintended consequences, particularly with respect to interference management and regulatory procedures; - any changes to allocations would have to be considered on a case by case basis; - our objective would be to seek an outcome that does not reduce the flexibility already afforded under the current regulations; - not to prejudge the proposals until the results of the studies have been completed, including appropriate impact assessments before developing a final position.

	instead of on a global basis through a deceptively simple definition change. A few respondents supported a “no change” position in bands used by satellite services	
Terrestrial fixed, mobile, and broadcasting convergence	BBC stated that terrestrial broadcasting platforms are, for the foreseeable future, likely to continue as the broadcasters’ primary means of delivery. It questioned the ability of other platforms to replace the existing broadcasting platform in terms of quality of service and open access and said this needs to be answered before pursuing wholesale convergence of fixed, mobile and broadcasting services.	Ofcom noted the concerns raised on the need to ensure certainty in the use of bands allocated to broadcasting as the primary platform for terrestrial broadcasting. As indicated earlier, Ofcom believes that any new allocation to a service should be carried out on a case by case basis taking into account flexibility requirements, interference management, market demand and technological trends.
Possibility to introduce generic satellite allocations	A few respondents observed that this agenda item also allows the possibility to consider “generic” satellite allocations (i.e. to convert individual FSS, BSS or MSS allocations to “GSS”) and agrees with Ofcom that there are no generic benefits of doing this. If this is to be considered, it would have to be done on a case by case basis.	Noted
Landing rights	Cable and Wireless raised a satellite specific issue related to satellite access to spectrum in a given country under the coverage area of a satellite and the ITU coordination procedures governing this. Cable and Wireless also pointed out the difficulty to access spectrum in the increasingly congested bands used for geostationary satellite and the emergence of new pervasive satellite systems such as Mid-Earth Orbit (MEO) systems and Low-Earth Orbit (LEO) systems which make technical compatibility resolution increasingly difficult.	This response highlights certain difficulties but does not suggest any change is required to improve the current satellite coordination procedures. Ofcom notes that landing rights are not directly addressed by the ITU and have been virtually eliminated within Europe by EU legislation.

Agenda Item 1.3 (12 responses – RSGB, BT, Met Office, Inmarsat, ESOA, Intelsat, SES, SkyTerra, ESA, Intellect, IATA, Orange, Paradigm)

Question 10: What are your views on the spectrum needs for the control of unmanned aircraft?

Issue raised	Comments	Ofcom response
General approach	A number of responses support the Ofcom position and highlight the potential benefits that Unmanned Aircraft (UA) would offer for stakeholders.	This is one of the reasons why it has been given a high priority. Ofcom is of the view that the current aeronautical allocations are most likely to be targeted (for UAS). Where this is not possible, other bands may be studied ensuring that no undue constraints are placed on existing services and that the opportunity cost of reserving spectrum for UAS is studied to assess the impact.

Future WRC	<p>A number of responses also noted the potential need for additional spectrum which would be required for non safety related functions (referred to as payload requirements).</p> <p>The RSGB raised concern over the potential that an agenda item for UAS at the WRC following WRC-12 might impact amateur radio allocations.</p>	<p>The next WRC might consider additional spectrum requirements for UAS, outside those required for the safe movement of UAS through non-segregated airspace. However, at this stage, it is too early to know whether such an additional agenda item will be considered. Moreover, Ofcom is of the view that payload or systems not related to the safe movement of the aircraft through non-segregated airspace can be considered at a national level and these requirements do not necessarily require global or regional regulatory action.</p>
Linkage to other issues/agenda items	<p>ESA and Intellect note bands which are, at present, not being studied in ITU-R and suggest bands that they or their stakeholders, have an interest in.</p> <p>A number of responses (Inmarsat, Skyterra, SAP-REG, SES, Paradigm and ESOA) note, with concern in some cases, the possible situation that UAS spectrum allocations are identified as aeronautical, in particular AMS(R)S. These respondents argue that this could limit use for other services (e.g. MSS and FSS) where they operate in the same bands due to the exclusivity (in Radio Regulatory terms) that an aeronautical safety service would have over other non-safety services. Responses suggest that generic MSS/FSS allocations be utilised for UAS, as to do otherwise, might limit the business case for a satellite system to be able to support UA operation in isolation, adding that this might also mean that spectrum is not used efficiently. One response, IATA, however felt that allocations for UAS should be solely reserved for aeronautical use.</p> <p>Inmarsat suggested that agenda items 1.25 and 1.3 be linked and that identifying new bands, for UAS, would help to relieve the spectrum demands on bands considered under agenda item 1.7.</p>	<p>Of the frequency bands mentioned; 15.4-15.5 GHz has recently been provisionally suggested by CEPT to be studied and the 5 GHz band is already being considered. However some of the other bands noted are not presently being considered; e.g. 920 MHz and 4.3 GHz. More recently additional bands have been included into the list of provisional bands, to be considered, through the activities of the responsible ITU-R Working Party.</p> <p>Ofcom notes that in many regions around the world, some of the bands identified are not allocated to aeronautical use and some expressly exclude aeronautical use (e.g. 890-942 MHz). Therefore Ofcom does not see benefit in suggesting frequency bands that are likely to raise concerns, particularly where aeronautical use is expressly excluded probably due to the difficult sharing environment that led to the exclusion in the first place.</p> <p>As noted above: non safety - payload requirements of UA can be considered at a national level and this would be for bands not needed for the safe movement of aircraft across controlled airspace. Ofcom welcomes the participation of interested stakeholders in the technical studies around the selection of frequency bands for UA.</p> <p>The designation of allocations for the safe movement of aircraft is primarily a safety consideration and therefore Ofcom's view is developed in cooperation with the Civil Aviation Authority (CAA) at a national level, which in turn works within the international framework agreed through the activities of the International Civil Aviation Organisation (ICAO).</p> <p>Ofcom will support generic allocations to the extent possible in line with our principles of technology and service</p>

		<p>neutrality. However, Ofcom recognizes that for services genuinely intended to provide safety of life services or where the use is required to ensure the safe movement of aircraft, such as this, special consideration is required.</p> <p>Finally, because of the degree of allocation exclusivity likely to be required in such safety situations, the amount of spectrum allocated for such services would have to be clearly and robustly justified</p> <p>Ofcom does not see an advantage in expressly linking agenda item 1.25 and agenda item 1.3, outside the normal liaison between the responsible regulatory groups. Finally Ofcom sees no reason, at this stage, to direct discussions towards new bands unless compatibility studies and demand requirements suggest otherwise.</p>
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Agenda Item 1.4 (9 respondents – WiTNESSS Project, O2, BBC, Vodafone, ESA, Intellect, IATA, Orange)

Question 11: What are your views on the technical and regulatory issues related to new aeronautical services? Is there a current or expected future demand from other services to use the bands identified under agenda item 1.4?

Issue raised	Comments	Ofcom response
General approach	A number of responses support Ofcom's position, that there should be no undue constraints on other services and the respondents highlight the bands they have a particular interest in.	The work on this agenda item is primarily considering the sharing with other services. In addition; Resolution 413 contains particular provisions to consider the broadcast FM service in the 87-108 MHz band and within Resolution 417 it is noted that the allocation (960 – 1164 MHz) was made knowing that studies are ongoing with respect to the technical characteristics, sharing criteria and sharing capabilities. Ofcom is participating in the relevant international groups conducting these studies.
The band 5000 – 5030 MHz	IATA and ESA comment on the 5000-5030 MHz band, with one supporting an allocation to AM(R)S in the band and the other suggesting that, where the band is to be used by the Galileo system, sharing between AM(R)S and RNSS (Radio Navigation Satellite Service) is not feasible	Ofcom continues to monitor the work related to the agenda item and supports the continuation of the sharing studies where there is a justification for an additional AM(R)S allocation.
Technology	The WiTNESSS Project stated that the	Ofcom notes that in relation to the

	<p>technology they have a particular interest in (which they state utilises ultra-wideband transmission techniques), is included in the consideration of this agenda item.</p>	<p>technology identified by the WiNESSS Project, according to European Commission Decision 2007/131/EC: “the use of frequency bands by equipment using ultra-wideband technology for air traffic management communications in aircraft and safety-of-life applications in ships does not fall under the R&TTE Directive and any use of such equipment in these safety-of-life environments should be determined by appropriate sector-specific regulation.”</p> <p>As a result proponents of the system would need to assess, based on the operational characteristics of the technology, the appropriate sector-specific regulations necessary.</p>
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Agenda Item 1.5 (9 respondents – BT, BBC, Met Office, Sky, Intelsat, SES, ESA, Intellect, Orange)

Question 4: Do you agree with Ofcom’s view that it is beneficial to identify spectrum for ENG use on a non-exclusive basis in order to support market-led, non-mandatory harmonisation?

Issue raised	Comments	Ofcom response
General approach	<p>The majority of responses supported Ofcom’s view. The responses which expressed concern did so in relation to the following specific sharing issues:</p> <ul style="list-style-type: none"> • The 23.6 – 24 GHz band where all emissions are prohibited according to RR 5.340 (Met Office). • Around 2 GHz due to the possible effect on MetSat Control command and 2.7 – 2.9 GHz radars (Met Office) • Various FSS and BSS bands (SES). • 2025 – 2110 / 2200 – 2300 MHz where there are already difficulties in Australia (ESA) 	<p>Ofcom notes the general support for our approach to this issue. Ofcom believes that the success of the agenda item will depend on the identification of broad tuning ranges which will inevitably cover certain bands where sharing with existing services is difficult. However, Ofcom believes it is highly unlikely that the ITU would identify a band where all emissions are prohibited for potential ENG (or any other) use. We will oppose such identification if necessary.</p>
Proposals	<p>Intellect recommended the following:</p> <ul style="list-style-type: none"> • Spectrum identification should not constrain or jeopardise the usage of spectrum already harmonized for the development of new and innovative services. A good example is the L-Band: a CEPT-wide harmonised spectrum band (under the Maastricht Agreement) for mobile multimedia services that are incompatible with ENG operation as several contributions to CEPT studies are recently demonstrating. • Ofcom to oppose the inclusion of already harmonized spectrum (such as for example L-Band) whenever this could be constrained or jeopardized by potential ENG use. 	<p>Ofcom does not expect ENG operation as envisaged under this agenda item to jeopardise the use of spectrum by other services. ENG use is on a secondary basis and the current preliminary CEPT brief on agenda item 1.5 clearly states in Annex 1 that the term ‘tuning range’ for ENG does not mean that this usage precludes the use of other applications in the same frequency range.</p> <p>The agenda item should identify tuning ranges over which radio equipment is envisaged to be capable of operating, but limited to specific frequency band(s) according to national conditions and requirements. Within these potential</p>

	<ul style="list-style-type: none"> • Spectrum identification process for ENG use should consider co-existence studies with potentially impacted services in order to avoid disruptions and Ofcom to oppose from the potential candidate identified spectrum for ENG use, that spectrum that does not satisfy the previously mentioned criteria (for example the L-Band). • Spectrum identification for ENG use should be as wide as possible and take into account professional vs. non professional use to have a future proof solution and allow each country to select the most appropriate frequency sub-band for ENG operation, depending on services deployed on a national basis and local market conditions. • Support Method 1 of the draft CPM text as the best approach to achieve and support Ofcom's view for a non exclusive non mandatory spectrum identification for ENG use. 	<p>operating ranges, countries will be able to authorise operation appropriate to their needs and national situation.</p> <p>Ofcom broadly agrees with the comments from Intellect, however, based on the aforementioned, we are not convinced that any specific band(s) should be excluded from consideration, other than bands covered by 5.340.</p> <p>Ofcom notes Intellect's support for Method 1 outlined in the draft CPM text. We believe however, that the adoption of a WRC Resolution - as proposed in Method 1 - could potentially lead to an undesirable outcome at WRC-12 becoming binding on Member States. For example, if the ITU was to identify a band for exclusive use of ENG, the inclusion of such an allocation in a WRC Resolution would hinder flexibility in UK spectrum management.</p> <p>We believe Method 4 of the draft CPM text to be the best method to achieve our objective of a non-mandatory approach to the harmonisation of tuning ranges for the use of ENG applications. We are minded to support further studies to be undertaken by designated ITU-R study groups, which could consequently lead to the adoption of an ITU-R Report.</p>
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Agenda Item 1.6 (4 respondents – RSGB, Met Office, ESA, Intellect)

Question 18: Do you have any comments on the use of spectrum above 275 GHz?

Issue raised	Comments	Ofcom response
General approach	<p>The RSGB and Intellect point out that the studies under this agenda item have resulted in an ever growing list of spectral lines being added to footnote 5.565 to the detriment of experimental work and the development of innovative active technologies.</p> <p>The Met Office and ESA support the identification of spectrum for passive services.</p>	<p>Ofcom is supportive of this issue but would not wish to see this agenda item result in a monopolisation of the spectrum for passive use. The UK view is that it is important to maintain future flexibility to encourage the development of innovative products and services, especially in less congested parts of the radio spectrum.</p>

Agenda Item 1.7 (9 respondents – RSGB, Met Office, Inmarsat, ESOA, SkyTerra, ESA, Intellect, IATA, Orange, Paradigm)

Question 12: What are your views on the use of the 1.6 GHz bands by MSS?

Issue raised	Comments	Ofcom response
	<p>Inmarsat, Skyterra, Intellect, and Paradigm support the idea of “No Change” to the current Radio Regulations as the current provisions in the Radio Regulations have proved to be adequate to meet the requirements for AMS(R)S. In addition SkyTerra, Intellect, and Paradigm indicated the need to ensure that future use of the bands will be carried out in a spectrally efficient manner. However, ESA believes that a change is required in the way such spectrum is assigned to aviation operations and this can only be done through a modification of the ITU Resolution 222, and that WRC-12 should force the ORM process to be more transparent in its decision making when assigning spectrum to AMS(R)S. Intellect noted that within this process there is work within a Single European Sky ATM Research (SESAR), which may involve increased use of the satellite systems, as envisaged by the ESA IRIS project, to carry the AMS(R)S ATM requirements. However that there was a need to balance the confidence of spectrum availability for future AMS(R)S projects such as IRIS on one hand with the need to ensure efficient use of highly congested spectrum on the other hand. Paradigm also consider that the identification of alternative bands for AMS(R)S requirements should be considered.</p>	<p>For the UK, Ofcom has considered this matter and sought guidance from the UK SSC. Ofcom retains the view that the current regulations are adequate for the purpose and that No Change is the correct position to take.</p>

Agenda Item 1.8 (6 respondents – RSGB, BT, Met Office, Vodafone, ESA, Intellect, Orange)

Question 5: Do you agree with Ofcom’s aim to seek an appropriate regulatory framework to facilitate the development of fixed service in the bands above 71 GHz?

Issue raised	Comments	Ofcom response
General approach	<p>The comments received are generally supportive of the Ofcom approach, with specific comments on the need to protect the passive services from both in band and adjacent band interference. Intellect suggested that Ofcom should ensure that there is no intention to extend the FS allocations.</p>	<p>Agenda item 1.8 was originally put forward by the UK and agreed by CEPT during preparations for WRC-07 to acknowledge the evolution of FWS technologies in the higher millimetre wave bands and to put in place a mechanism so that ITU-R technical studies and the Radio Regulations could be reviewed with the aim of ensuring that a suitable, flexible and timely regulatory environment is in place to accommodate these FWS technologies as they develop. The agenda item incorporates Resolutions 731 and 732 which were developed at</p>

		<p>WRC-2000 in response to a re-organisation of the frequency allocations in Article 5 of the RRs which was undertaken to cater for passive service requirements above 71 GHz (WRC-2000 Agenda Item 1.16). At that time the requirements of the passive science service were well known however, the requirements of the active services were not and since it was recognised that at some point in the future there would need to be a consideration of the active service requirements, Resolutions 731 & 732 were developed and agreed as a regulatory placeholder so that the requirements of the active services could be considered at an appropriate time.</p> <p>As with all WRC agenda items the main aim of the agenda item is considered taking into account existing service requirements, so if changes are deemed necessary to facilitate the aim of the agenda item, consequential changes may also need to be considered to take into account existing services.</p> <p>During the current WRC-12 preparatory work, proposals have been put forward under agenda item 1.8 that relate solely to the protection of EESS from the existing FS allocations in certain adjacent bands under the existing regulatory framework. The proposals include the introduction of mandatory, fixed, technical limits on FWS systems in the RR. Ofcom notes that the Met Office & ESA has indicated support for these limitations in response to the Ofcom consultation. Ofcom would like to highlight that while the adequate protection of passive services remains an important objective for the UK in general, particularly when changes to the RR are being made that could impact on EESS, it should however be noted that Resolutions 731 & 732 do not specifically cover adjacent band compatibility studies between FS & EESS. In addition the pursuit of mandatory, fixed constraints on existing FS allocations under this agenda item that seek to limit rather than facilitate flexible development in the Radio Regulations, in isolation to any changes to the existing framework of the Regulations, is not consistent with the main aim of the agenda item and runs the risk of distracting from the main objectives of the agenda item.</p> <p>Our current position is therefore to continue to pursue the primary purpose of</p>
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		this agenda item and seek to influence the development of European common positions consistent with this aim.
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Agenda Item 1.9 (2 respondents – Intellect, Orange)

Question 13: What are your views on the Appendix 17 frequency arrangements for maritime use?

Issue raised	Comments	Ofcom response
General approach	<p>Intellect supports a revision of Appendix 17 to facilitate the use of new digital communication systems, whilst maintaining sufficient provisions for remaining operational requirements involving Narrow Band Direct Printing (NBDP) within the GMDSS. Adding that any changes to Appendix 17 should be implemented within a certain transition period.</p> <p>Orange agreed with the Ofcom position.</p>	Ofcom agrees with the Intellect comments, and as noted in the consultation, Ofcom views this agenda item as a low priority item and looks towards an equitable and proportionate solution.

Agenda Item 1.10 (5 respondents – UKMPG/BPA, RSGB, BBC, ESA, Intellect)

Question 14: What are your views on the need for additional allocations for maritime mobile use to enhance maritime safety and security?

Issue raised	Comments	Ofcom response
General approach	<p>Intellect supported in principle the introduction of new technologies for maritime and security applications, but note concerns of the possible impact where high powered systems are used.</p> <p>The BBC stated that they have no view provided there are no additional restrictions placed upon the use of, or increased interference to, the bands used for broadcasting in the UK.</p> <p>RSGB noted the potential overlap of one of the agenda item sub items, with agenda item 1.23.</p>	<p>Ofcom notes the concerns, although at this stage of the discussions there are no details of the particular systems that would be employed. Ofcom would expect that, when the precise technical characteristics become clearer, that the compatibility analysis would take account of the potential impact upon other services.</p> <p>Ofcom supports the principle that no undue restrictions, or harmful interference, be placed upon broadcasting services. Presently, there is nothing that suggests that any of the agenda item sub items would impact services within broadcasting allocations.</p> <p>Ofcom, through liaison with the Maritime and Coastguard Agency (MCA), supports a process that expedites the agenda item in a constructive and effective manner and will review the situation, with respect to the link with agenda item 1.23, as the work progresses.</p>

	<p>ESA supported the sub item which addresses the potential revision of Appendix 18, where this helps to enhance the usefulness of satellite detection of Automatic Information System (AIS).</p> <p>Intellect and UKMPG/BPA question the position taken by Ofcom on this particular agenda item. Intellect, whilst noting that Ofcom were promoting this agenda item, added that they felt that Ofcom's approach was at odds with the current CEPT position which indicates that changes to the Radio Regulations are only necessary where sharing studies proved the case for additional allocations.</p> <p>United Kingdom Major Ports Group (UKMPG) and the British Ports Association (BPA) suggest that the Ofcom position on this agenda item was weak and this was because there appeared to be no strategic plan around how these channels would be put into operational use.</p>	<p>Ofcom, through liaison with the MCA, is monitoring activities under this sub item.</p> <p>Agenda item 1.10 is split into a number of sub items and the item the UK has made formal representation on is a proposal to split a number of the two frequency channels in Appendix 18 into single frequency channels. Whilst this, where agreed, would require a change to the Radio Regulations, it would not result in additional allocations for maritime use and Ofcom would look for justification for any proposals that did so. In respect of the other sub items of this agenda item, Ofcom agrees that additional allocations, for maritime use, should be appropriately justified.</p> <p>Ofcom is aware that there is a shortage of globally recognised single-frequency channels that can be used for port operations and that is the reason the UK initiated these proposals. The detail around national implementation would come after the proposed international changes, where enacted. As a result, at this stage it would be too early to say how the detailed national allocations would be facilitated and might pre-judge the outcome of the international activities. With respect to the comment on the weak position taken in the international discussions, Ofcom continues to work with the MCA and other stakeholders on the development of this agenda item. Ofcom has recently held discussions with a number of maritime stakeholders, and as a result Ofcom has refined the UK position on some of the related activities within this agenda item.</p>
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Agenda Item 1.11 (3 respondents – ESA, Intellect, Orange)

Question 19: Do you have any views on space research use of the band 22.55 – 23.15 GHz? Is there a current or expected future demand from other services to use this band?

Issue raised	Comments	Ofcom response
General approach	The comments received are supportive of an allocation for space research. ESA point out that compatibility studies have shown positive results. Intellect and Orange indicate that this should not result in constraints on incumbent services.	The comments received are consistent with the Ofcom approach.

Agenda Item 1.12 (5 respondents – BT, Intelsat, ESA, Intellect, Orange)

Question 20: Do you support the protection of science services in the band 37 – 38 GHz? Do you know of any requirements for aeronautical mobile use or any other current or expected future demand in this band?

Issue raised	Comments	Ofcom response
General approach	BT and Orange note the extensive deployment of fixed links in this band, Intelsat notes that the upper half of the band is allocated to FSS for space to Earth operation. ESA supports excluding Aeronautical mobile from the band, while Intellect questions why aeronautical was permitted in the first place.	The comments received are consistent with the Ofcom approach.

Agenda Item 1.13 (8 respondents – BT, BBC, Sky, ESOA, Intelsat, SES, Intellect, Orange)

Question 6: Do you agree with Ofcom's intended approach to use of the band 21.4 – 22 GHz?

Issue raised	Comments	Ofcom response
General approach	All responses support Ofcom's approach to this agenda item, other than with regard to additional feeder links (see below).	Noted.
Additional BSS feeder link spectrum	<p>The BBC stated that any proposal for additional spectrum should have full justification, evidence and an assessment of the implications for other services.</p> <p>ESOA supports the allocation of additional spectrum for feeder links in Regions 1 and 3, and suggests studies in the bands:</p> <ul style="list-style-type: none">• 22.5 – 23.6 GHz• 24.0 – 27.5 GHz• 31.8 – 33.4 GHz <p>With a preference for 24.75 – 25.25 GHz with an extra 100 MHz above or below.</p>	<p>Ofcom fully endorses this comment.</p> <p>Ofcom would need to see a detailed justification for the ESOA proposals before this could be taken further.</p>
Queue jumping	Intelsat, SES and Intellect support maintaining the first come first served approach with particular concern expressed over the proposals for queue jumping due to the precedent this would set.	Ofcom supports the "first come, first served" approach and shares concerns over the queue jumping proposal.

Agenda Item 1.14 (3 respondents – RSGB, Intellect, Orange)

Question 15: Do you agree with Ofcom seeking to protect services operating in the UK from any impact due to long range VHF radar systems?

Issue raised	Comments	Ofcom response
General	The RSGB expressed concern about high	The band 142-144 MHz is no longer being

approach	<p>power emissions in the band 142 – 144 MHz adjacent to the 144 – 146 MHz amateur band.</p> <p>Intellect commented that Ofcom should not rule out technical studies; however both Intellect and Orange support the protection of existing services.</p>	<p>considered within the activities of this agenda item.</p> <p>The comments received are consistent with the Ofcom approach.</p>
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Agenda Item 1.15 (4 respondents – RSGB, BBC, Met Office, Intellect)

Question 21: Do you have any views on HF Oceanographic Radars operating in the range 3 – 50 MHz?

Issue raised	Comments	Ofcom response
General approach	<p>The Met Office indicated their support for the agenda item as a potential future user of these radars, but point out the need for compatibility studies with wind profiling radars around 45 MHz.</p> <p>The BBC pointed out the need to protect HF broadcasting, and also adjacent HF fixed service spectrum which is used for broadcasting under RR 4.4.</p> <p>The RSGB pointed out the requirement to protect amateur services.</p>	<p>The comments received are consistent with the Ofcom approach, however whilst we will seek to avoid any conflict between these radars and BBC HF operations, we cannot seek protection of broadcasting under RR 4.4 at international level.</p>

Agenda Item 1.16 (4 respondents – RSGB, EA Technology, Met Office, Intellect)

Question 22: Do you have any views on the protection of lightning detection systems from interference?

Issue raised	Comments	Ofcom response
General approach	<p>The Met Office indicates strong support explaining that these systems have operated since 1939 and the purpose of the agenda item is to gain international recognition and long term protection.</p> <p>EA Technology submitted details of their system which is designed to protect workers on overhead power lines in the UK and the Republic of Ireland.</p> <p>The RSGB and Intellect express support for the Ofcom position.</p>	<p>Ofcom was instrumental in securing this agenda item and will continue to seek to bring it to a satisfactory conclusion.</p> <p>Ofcom notes the response from EA Technology in relation to A1.16. Unfortunately work on this Agenda item only refers to Meteorological Aids services interests between 9 and 20 kHz. The lower limit of 9 kHz derives from the lowest frequency range as defined within Article 5 of the ITU Radio Regulations. Given that the EA technology lightning detection system operates at 1 kHz, this system would fall outside considerations for this Agenda item</p>

Agenda Item 1.17 (9 respondents – O2, BT, BBC, T-Mobile, Sky, Vodafone, Intellect, Cable & Wireless, Orange)

Question 7: Do you agree with Ofcom's approach to the sharing issues in the band 790 – 862 MHz?

Issue raised	Comments	Ofcom response
General approach	<p>All responses agree with Ofcom's approach to this agenda item; however the BBC considers that in addition to the objective to enable the deployment of mobile networks, Ofcom should equally promote protection of the existing services.</p> <p>Several responses pointed to the need to ensure the results obtained at WRC-07 are not undone at WRC-12, and supported the high priority assigned to this agenda item.</p>	<p>The comments received are consistent with the Ofcom approach.</p> <p>Ofcom supports these comments.</p>

Agenda Item 1.18 (6 respondents – O2, BT, T-Mobile, ESA, Intellect, Orange)

Question 16: Do you agree with Ofcom supporting the extension of RDSS allocations in the band 2483.5 – 2500 MHz, whilst seeking to protect other services operating in the UK?

Issue Raised	Comments	Ofcom response
General approach	<p>Most responses are supportive of the aims of the agenda item. Several state the need to ensure that there is no impact to the award of the band 2500 – 2690 MHz, although Orange point out that there may be synergies between terrestrial mobile systems and next generation Galileo due to shared hardware which is not possible in other RNSS bands.</p>	<p>The comments received are consistent with the Ofcom approach.</p>

Agenda Item 1.19 (13 responses - RSGB, O2, BT, BBC, T-Mobile, Met Office, SES, Vodafone, ESA, Intellect, Google, IATA, Orange)

Question 26: Do you agree with Ofcom's view that no changes are needed in the Radio Regulations to implement SDR/CR?

Issue Raised	Comments	Ofcom response
Agreement that no changes are required in the Radio Regulations	<p>Most respondents agree with Ofcom's view that no changes are needed in the Radio Regulations to implement SDR/CRS and that harmonisation of spectrum access for CRS should be done outside the Radio Regulations on a non mandatory basis.</p> <p>Vodafone further stated that there was no</p>	Noted

	<p>need for a “worldwide harmonized cognitive supporting pilot channel”, as described in Resolution 956. Different cognitive systems are likely to have different needs in this regard, and there are several different types of network in existence that can already provide this capability</p>	
<p>Concerns on SDR and CRS operation in certain radio services</p>	<p>The Met Office felt that the Radio Regulations should have specific provision to prohibit SDR and CRS from operating in passive bands where footnote 5.340 already prohibits any emissions. It further stated that leaving regulation to be carried out on a regional or national basis is unlikely to provide the required level of protection globally, as some countries are unaware of the use of the passive bands to make observations over their territories (and benefitted from it) by satellites operated by other countries or agencies.</p> <p>ESA stated that some form of guarantee at the ITU level is needed to ensure that that terrestrial CRS use will not impact satellite spectrum use and quality of service. It is concerned that totally unregulated use of SDR/CRS could lead to operations not in compliance with the current ITU regulations.</p> <p>IATA stated that it cannot accept the operation of software defined radios in bands allocated to aeronautical services unless they are intended for and have been properly certified for use in an aeronautical application. Furthermore, it felt that regulatory measures are required in the Radio Regulations to prohibit the operation of CRS in bands allocated to aeronautical services.</p> <p>SES noted various concerns relating to the operation of CRS and stated that these have to be solved before CRS can be authorised in bands used by satellite services.</p>	<p>Ofcom believes that having specific provisions in the Radio Regulations prohibiting SDR/CRS operations in certain bands is neither justified nor proportionate. These are technologies that could be used in any band as long as they comply with the existing provisions in the Radio Regulations and national rules governing the use of the band similar to how other radio stations are regulated today.</p> <p>Ofcom further notes that with regard to concerns on improper use of CRS and SDR not in accordance with national or international regulations, the same risk already exists today with other types of technology.</p> <p>Ofcom could support further studies in the ITU-R Study Groups (through ITU-R Question(s) or ITU-R Resolution(s)) to develop ITU-R Recommendations and Reports providing guidance on implementation of CRS.</p>
<p>Further studies and the approach</p>	<p>SES suggested that Ofcom should not discount the possibility of developing ITU Recommendations (developed through the Radiocommunication Assembly/Study Group process) on how CRS or SDR devices could share with existing services in a given frequency band . This would provide device manufacturers with an international framework to develop</p>	<p>As indicated in the previous response, Ofcom could support further studies to be carried out in the ITU-R Study Groups and will consider the merit on a case by case basis.</p>

	products and provide a basis for satellite systems which are inherently regional or global in nature to receive consistent levels of protection across their service areas.	
Others	<p>BBC considers that CRS:</p> <ul style="list-style-type: none"> • should operate on a non protected non interference basis with respect to terrestrial broadcasting and PMSE services; the technical criteria and conditions need to be established. • must not hinder the technology and service evolution of the incumbent broadcasting devices • should be considered for use in all frequency bands 	Noted
Resources	<p>Google believes that Ofcom should continue to focus resources on this agenda item. Not doing so runs the risk that the good work done to date in the UK will be undone within the ITU, putting the UK out of step with the international environment. It understood that a number of Administrations are proposing that every band is studied at the ITU level before CRS is allowed access. This step, which amounts to over-regulation could, at best, slow down the development of CRS by many years, and at worst, create technical restrictions that make the deployment of CRS impossible for a generation.</p>	<p>Ofcom's objective is to ensure that constraints are not introduced in the Radio Regulations that would prevent the operation of CRS and SDR in specific frequency bands.</p> <p>As CRS and SDR are technologies rather than radio services, Ofcom does not believe that administrations would be prevented from granting CR access in their national territories as long as such use complies with the existing provisions of the RRs in the prevention of harmful interference to the operation of radio stations by other administrations.</p>

Agenda Item 1.20 (7 respondents – RSGB, BT, Met Office, Inmarsat, Intelsat, SES, ESA, Intellect, Cable & Wireless, Orange, Paradigm)

Question 8: Do you agree with Ofcom's objective to protect the existing services from deployment of HAPS?

Issue raised	Comments	Ofcom response
General approach	The majority of responses support Ofcom's approach to this agenda item, none of the comments disagreed.	Noted.
Passive Sensing (RR 5.458)	The Met Office pointed out that the band 6425 – 7075 MHz is used for passive remote sensing by satellite over the oceans, and administrations are requested to bear this use in mind when planning the use of these bands (RR footnote 5.458). ESA also expressed an interest in this topic.	The UK view was recently modified to address this issue.
FSS Earth stations	Intelsat pointed out that HAPS at around 20 km altitude may be vulnerable to FSS uplinks to satellites at 36000 km.	Ofcom would not wish to see any additional constraint on FSS as a result of HAPS deployment.

Agenda Item 1.21 (4 respondents – Inmarsat, ESA, Intellect, Orange)*Question 17: Do you have any view on the introduction of radiolocation in the band 15.4 – 15.7 GHz?*

Issue raised	Comments	Ofcom response
Link to other agenda items	Inmarsat and Intellect both pointed out the link to agenda item 1.25 and suggest that consideration should be given to MSS in the absence of interest in radiolocation. ESA pointed out the link to both agenda items 1.3 and 1.25.	Ofcom is considering the linkage between these agenda items. Although at this stage, Ofcom does not see an advantage in expressly linking the agenda items outside the normal liaison between the responsible regulatory groups
Adjacent band	Orange, as a user of the adjacent 14.5 - 15.35 GHz fixed service band, supports introduction providing there is no impact on this band	Noted.

Agenda Item 1.22 (7 respondents – RSGB, BBC, Met Office, SES, ESA, Intellect, Orange)*Question 27: Do you agree with Ofcom's view that it is not necessary to regulate SRDs via the Radio Regulations?*

Issue Raised	Comments	Ofcom response
No change is necessary in the Radio Regulations to introduce SRDs	Most respondents believed that regulation of SRDs can be achieved through ITU Recommendations (developed through the Radiocommunication Assembly/Study Group process) to address specific frequency bands for harmonisation, regulation of emissions or appropriate provisions for SRDs to protect existing services. Intellect stressed the need for timely availability of spectrum for SRDs to maximise benefits to UK citizens and other countries. RSGB highlighted the benefits of harmonized frequency allocations for SRDs but noted that regulations are best left to regional coordination.	Noted
Regulations needed in the Radio Regulations to protect active and passive remote sensing bands	The Met Office and ESA expressed concerns that national or regional regulations would be insufficient to prevent the operation of SRDs in one country to potentially interfere with passive satellite sensors operated by other countries which are global in nature. Aggregate interference from high density SRD systems could also interfere with passive satellite sensors. The Met Office further stated that use of the passive and certain active remote	The protection of active and passive remote sensing bands is taken into account when developing the appropriate regional regulations for emissions of SRDs. Ofcom believes that this remains the most appropriate route to regulate SRDs noting that generally the same administrations authorizing SRDs' use also participate in the relevant international meteorological organizations and that the protection required for such services are best served

	sensing bands by SRDs should be specifically prohibited in the Radio Regulations.	through mutual cooperation.
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Agenda Item 1.23 (4 respondents – Confidential, Towns Mr J, RSGB, Intellect,)

Question 23: Should Amateur radio be given an allocation in part of the band 415 – 526.5 kHz, and if so where?

Issue raised	Comments	Ofcom response
General approach	<p>Intellect highlighted the need to balance this agenda item, with the potential requirements of agenda item 1.10.</p> <p>Jonathan Towns and the RSGB support the aims of the Agenda item, in particular where use is related to the support of UK/regional emergency services.</p> <p>RSGB recommend raising the priority level from “low” to “medium”.</p> <p>Mr Towns highlighted the UK investment made in the D-Star system, which they claim will be lost if an allocation is not made.</p> <p>One confidential response incorrectly identified the frequency band as around 500 MHz.</p>	<p>Ofcom agrees and continues to monitor developments under both agenda items. The UK view will develop as more information becomes available, as it is probably too early to come to a definitive view and so will support studies, put forward options and liaise with the MCA with respect to the linkage with AI.1.10.</p> <p>As part of this allocation is already permitted to be used in UK, any support this use makes, in relation to the emergency services, can continue outside the consideration of the agenda item. The proposal to raise the priority of this agenda item will be discussed by IFPG.</p> <p>As noted, UK use of a part of this band is already established via a Notice of Variation to existing amateur licensees where there is no potential for interference. D-Star is a data protocol system, that seems to be predominately used in bands above 50 MHz (i.e. does not solely operate in the 415-526 kHz band). Therefore UK use of D-Star would seem to be unaffected by the final outcome of this agenda item.</p>

Agenda Item 1.24 (6 respondents – RSGB, Met Office, SES, ESA, Intellect, Orange)

Question 24: Do you agree with Ofcom’s approach to support an allocation to the meteorological satellite service, subject to not constraining other services, in the band 7850 – 7900 MHz? Is there a current or expected future demand from other new services to use this band?

Issue raised	Comments	Ofcom response
General approach	<p>The Met Office supports the agenda item and Ofcom’s approach, explaining that the allocation is necessary to download large quantities of meteorological data.</p> <p>The RSGB supports Ofcom’s approach on the basis that these activities underpin propagation research.</p> <p>SES stated that the accommodation of multiple services should be considered to</p>	<p>The comments received are consistent with the Ofcom approach to this agenda item.</p> <p>Ofcom agrees in principle with the comment from SES. However, this would need to be addressed under a more generic agenda item (i.e. Agenda item 1.2) in order to secure wider benefits of more flexible use of spectrum.</p>

	<p>maximise spectrum efficiency.</p> <p>Intellect and Orange support the allocation, subject to not placing constraints on FS</p>	
Link to agenda item 1.25	<p>SES notes that this band is under consideration in ITU-R WP4C for MSS under agenda item 1.25.</p> <p>ESA notes that the use of this band for MSS under agenda item 1.25 is not supported by CEPT.</p>	Ofcom will monitor developments in relation to a possible link to agenda item 1.25 carefully.

Agenda Item 1.25 (17 respondents – RSGB, BT, T-Mobile, Met Office, Inmarsat, Astrium Satellites, ESOA, Intelsat, SES, SkyTerra, Vodafone, ESA, Intellect, IATA, Avanti, Orange, Paradigm)

Question 9: What is your view on the need for additional spectrum to be allocated for mobile satellite services?

Issue raised	Comments	Ofcom response
General approach	<p>A number of responses supported the need to carefully consider new MSS allocations, ESA noted that new MSS will open up opportunities and new applications for future MSS, while Vodafone agreed with Ofcom that any new MSS allocation must have a good business case. However, the majority of others were concerned with the protection of existing services such as mobile, fixed and other satellite services, (such as the access for Aeronautical Satellite communications, fixed satellite links, Earth Exploration Satellites for active and passive sensing, Space Research and Meteorological Satellite services).</p>	Ofcom notes these points and believes that the current UK IFPG position for WRC-12 agenda item 1.25 has already captured the concerns and comments raised during the WRC-12 consultation.

Section 4

Standing agenda items

(13 respondents – RSGB, BT, BBC, Met Office, Professor F Lyall, Inmarsat, ESOA, Intelsat, SES, SkyTerra, ESA, Intellect, Avanti)

Question 28: Do you have any comments concerning the standing agenda items?

Issue raised	Comments	Ofcom response
Satellite notification and co-ordination	<p>BT and Intellect requested Ofcom to take a proactive stance in this area to address the inefficiencies in the satellite filing process. BT explained that the current environment creates market bottlenecks, prevents meaningful competition and removes incentives for innovation.</p> <p>Inmarsat pointed out the need to examine the large number of distinct proposals in detail and supports retention of this standing agenda item.</p> <p>ESOA made the following comment on agenda item 7 (Res86): <i>Nos. 11.41 and 11.42:</i> ESOA supports the current CEPT view on this issue, i.e. Recommend that cases of harmful interference reported during the 4-month period that were not resolved by the end of that period should not lead to cancellation of the incoming assignments to space stations provisionally recorded under No. 11.41.</p> <p>Intelsat highlighted three issues addressed in the Chairman's Report of the Second Meeting of the Working Party of the Special Committee:</p> <p><i>Application of Nos. 11.41 and 11.42 of the Radio Regulations (Provisional/Definitive Recording of Frequency Assignments) –</i> We support Method B as described Annex 10 of the SC-WP Chairman's Report.</p> <p><i>List of Satellite Networks with which Coordination Needs to be Effected (Application of No. 9.36 of the Radio Regulations) –</i> We support Method B as described Annex 14 of the SC-WP Chairman's</p>	<p>Ofcom holds the CEPT coordinator role for Agenda Item 7 and is thus proactively involved in the issues raised. We are also closely involved in the development of the CEPT position for the issues in Agenda Item 8.1.</p> <p>In respect of the comments relating to due diligence for satellite networks, we recall that the subject of financial vs administrative due diligence was debated at WRC-97 with administrative due diligence, as implemented through Resolution 49, being adopted as the way forward. We take a proactive stance in our processing of satellite filings, as set out in our document Procedures for the Management of Satellite Filings¹. We agree that there are elements of the current international due diligence regime that could be addressed so as to improve the accuracy of the information supplied.</p> <p>The UK position for Nos 11.41 and 11.42 is in line with the CEPT position, which is that cancellation at the end of the 4 month period is felt to be too drastic a step. This is fully aligned with the comments received.</p>

¹ http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/satellite/procedure_manuals/spectrum_filings/

	<p>distinctions between BSS and FSS. Many applications are unique to only one of the services and these applications justify maintaining the distinction between them.</p> <p>3. <i>Resolution 49.</i> SES believes that consideration should be given to improvements in Resolution 49 that could assist in achieving efficient use of the spectrum/orbit resource. For example, the timing of the submission of Resolution 49 should be studied further as this may allow more accurate information to be submitted.</p> <p>4. <i>The concept of steerable beams in Annex 2 of Appendix 4 of the Radio Regulations.</i> Steerable beams are a reality on many operational satellites. SES believes that the concept of steerable beams should be maintained in order to not disadvantage operational and planned satellites with steerable beam capability. Further, SES finds that the steerable beam concept provides operators with necessary flexibility to develop a satellite as market requirements evolve or mature.</p> <p>ESA expressed concern that L-Band CGC may have an impact on core MSS use.</p> <p>Professor F Lyall expressed the following concerns about the registration system for space systems:</p> <p>Under Art. VI of the Outer Space Treaty 1967, it is the duty of the national state of an entity which wishes to make use of space to license that activity and continuously to supervise it to ensure that international and national law is complied with.</p> <p>The first-come, first-served principle is sensible and pragmatic, but it opens the possibility that an ITU state member may seek to derive income by in effect acting as an agent for commercial interests. The Tonga case was the first, but a number of small states including ones for which I believe Ofcom acts as post-box are examples. The offering of the licensing of space services by a state largely in order to generate income for itself or its nationals is wrong in itself, and may be an attempt to get round the proper application of international law including</p>	<p>With regard to Professor Lyall's comments: As per its published Procedures for the Management of Satellite Filings, Ofcom performs due diligence on every filing irrespective of whether it comes to us direct from the operator concerned, or through one of the UK Overseas Territories.</p> <p>It would be inappropriate to create regional bodies to judge the competencies of ITU member states since the ITU Constitution and Convention specifically recognise the sovereignty of each member state. Modifying these instruments is beyond the scope of a WRC. It would be an inefficient use of scarce resources to reserve certain orbital positions for world public services; however examples exist of satellite operators providing world public services (e.g. Intelsat, the privatised operator created out of the International Telecommunications Satellite</p>
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	<p>the Outer Space Treaty rules as to licensing and supervision.</p> <p>The current system permits what could in effect be flags of convenience. In the commercialisation of space entrepreneurs can shop around to register the orbits/frequencies they wish to use through such an agency.</p> <p>The ability of small states to perform due diligence in relation to the initial notification of a space assignment to ITU-R or continuously to supervise the space activity concerned may be doubted. Small states may lack the technical expertise so to act - such expertise being considerably more than that required for terrestrial radio (though the point may apply there also).</p> <p>One remedy might be to make the ability of states to register assignments with ITU-R conditional on the possession of the necessary technical expertise to perform due diligence as to the notification, and to supervise the space activity. Another possibility would be to have regional authorities deal with such matters, allowing for the appointment (and training) of competent personnel.</p> <p>Correlative to the above, but going beyond it, the general world public interest is not best served by the existing ITU procedures. States notify space assignments in their own national interest or in the interests of commercial and other entities for which they act. In orbit or frequency use there is no consideration of the world interest as a whole. ITU-R and the Radio Regulations Board should be reconsidered. Where an assignment has global implications (as is the case for space assignments) an international Communications Commission should be established having the ability to decline the registration of a frequency assignment which does not serve the world interest.</p> <p>The Radio Regulations set aside frequencies for specific uses, but that facility does not extend to orbits. Some orbits should be set aside for general world public service uses only, e.g. for GPS and meteorological and other scientific uses, this to prevent their being dominated by commercial broadcasting enterprises.</p>	<p>Organisation, remains under obligations to provide lifeline communications to developing countries).</p>
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Report of the Director	The BBC pointed out that the Report of the Director can give rise to major issues and urges Ofcom to be vigilant. Similarly, Inmarsat stated that the report may contain surprising and unwanted proposals to amend the RR.	Ofcom will carefully monitor developments in this area.

Section 5

Future WRCs

(10 respondents – RSGB, BBC, T-Mobile, Inmarsat, Astrium Satellites, SES, Vodafone, Intellect, Airbus, Orange)

Question 29: Are there any items you wish to see addressed by future WRCs?

Issue raised	Comments	Ofcom response
General process	<p>Several comments stressed the importance of this agenda item, some pointing out that the process has not always received the attention it deserves.</p> <p>Intellect expressed disappointment that Ofcom has not provided more information on its own priorities for the future and suggests that the national preparatory process needs to be improved in this area.</p>	<p>Ofcom notes the views expressed. We agree that, historically, the agenda setting process has not always been conducted with the appropriate priority and resource it merits considering that the agenda is the focus of the following ITU study cycle and has major implications for virtually all spectrum users.</p>

Amateur	<p>The RSGB identified their medium/long-terms priorities as:</p> <ul style="list-style-type: none"> a) Addressing congestion in the HF bands by seeking an Amateur Service allocation near to 5 MHz and expansion of the existing allocations at 10, 14 and 18 MHz, with, in the longer-term revisiting the WRC-07 agenda item on 7.2 – 7.3 MHz. b) The harmonisation of Amateur Service allocations in Regions 2 & 3 with Region 1. This would be through the retention of the exclusive 50 MHz allocation to the Amateur Service where it now exists, and provision of at least 2 MHz in other geographical areas, with at least 500 kHz on an exclusive basis. A harmonised allocation for the Amateur Satellite Service in this band is also sought to bridge the gap between 28 and 144 MHz. c) A Region-1 allocation at 3400 MHz of 10 MHz on a secondary basis to enable harmonisation with Amateur and Amateur Satellite Service allocations in Regions-2 & 3. d) Opportunities are also sought for modest size allocations (perhaps 10-50 MHz wide) at low atmospheric attenuation spots that would bridge the large gaps between our 10, 24 and 47 GHz allocations e) Amateur Services experimental access or formal allocations above 275 GHz 	Ofcom will include all information submitted in the first discussions of potential future agenda items in the IFPG.
IMT	<p>T-Mobile urged Ofcom to pursue an agenda item at WRC-16 for additional spectrum for IMT.</p> <p>Vodafone explained that decisions taken at WRC-16 will not come into effect until around 2020 and by that time there is likely to be a need for more spectrum for mobile services, particularly IMT.</p>	
Satellite	Astrium Satellites suggested a harmonised UHF allocation in digital dividend spectrum for mobile satellite smart grid applications and suggests further discussions with Ofcom.	
WAIC	Airbus suggested that Wireless Avionics Intra-Communications (WAIC) should be included on the agenda of the next WRC.	

List of abbreviations

5.340	An ITU provision for frequency bands where all emissions are prohibited
AIS	Automatic Identification System
AM(R)S	Aeronautical Mobile Service for On-route use
AMS(R)S	Aeronautical Mobile Satellite Service for On-route use
Appendix 18	Specific Maritime provisions in the ITU Radio Regulations
ATM	Air Traffic Management
BSS	Broadcasting Satellite Service
CAA	Civil Aviation Authority
C-band	4 - 8 GHz
CEPT	European Conference of Postal and Telecommunication Administrations
CPM	Conference Preparatory Meeting
CRS	Cognitive Radio System
D-Star	Digital Smart Technology for Amateur Radio
EESS	Earth Exploration Satellite Service
ENG	Electronic News Gathering
ESOA	European Satellite Operators Association
ESA	European Space Agency
FS	Fixed Service
FSS	Fixed Satellite Service
FWS	Fixed Wireless Systems
Gallileo	A GNSS project being developed by the EU and ESA
GMDSS	Global Maritime Distress and Safety System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HAPS	High Altitude Platform System
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IFPG	International Frequency Policy Group
IMT	International Mobile Telecommunications
IRIS	ESA Programme: air traffic management communications via satellite
ITU	International Telecommunication Union
Ku-band	12 – 18 GHz
L-band	1 – 2 GHz
MCA	Maritime and Coastguard Agency
MSS	Mobile Satellite Service
ORM	Operator Review Meeting (for mobile satellite operators using L-Band)
PMSE	Programme Making and Special Events
RNSS	Radionavigation Satellite Service
RSGB	Radio Society of Great Britain
RSPG	Radio Spectrum Policy Group
SC-WP	Working Party of the Special Committee
SDR/CRS	Software Defined Radio/Cognitive Radio System
SESAR	European project for a single European sky
SRD	Short Range Device
UA	Unmanned Aircraft
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle
UHF	Ultra High Frequency (in the context of this report refers to TV broadcasting spectrum)
UK SSC	UK Spectrum Strategy Committee
WAIC	Wireless Avionics-Intra Communications
WAPECS	Wireless Access Policy for Electronic Communications Services
WRC	World Radiocommunication Conference

Note: Frequency ranges shown in this table are indicative examples