

**Avanti Communications Group plc**

**Response to Ofcom consultation document:**

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

**19 September 2014**

**Introduction**

Avanti Communications Group plc (Avanti) is pleased to provide comments to Ofcom in response to the consultation document: “Ofcom consultation on the UK preparations for the ITU World Radiocommunication Conference 2015 (WRC-15)”.

**General 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?](#)

Avanti is directly involved in the UK preparatory process. Avanti believes that OFCOM should consider the interests of bone fide UK HQed satellite operators in preparation to WRC-15.

As general comments, we wish to emphasise that the Radio Regulations and the actions taken at ITU World Radiocommunication Conferences are very important for all satellite operators. The provisions of the Radio Regulations related to satellite services are highly relevant to the development of satellite services in the UK and are highly relevant to the UK and European space industry as a whole. In particular, the availability of internationally harmonised allocations to space services is vital to support the development and the deployment of satellite services. Furthermore, it is necessary to ensure that sharing arrangements with other services in the Radio Regulations do not lead to interference to or from satellite services. This means that, in some instances, it is necessary for administrations to refrain from making certain bands available to particular services in order to maintain the global or regional harmonisation of space service allocations.

Avanti notices that Ofcom gives strong support to meeting the spectrum requirements for terrestrial mobile broadband. Avanti is concerned that despite giving a high emphasis to meet the demands for terrestrial mobile broadband, the actual spectrum requirements are not adequately scrutinised. In this regard, we remind Ofcom of the ESOA comments provided in response to the consultation on the Mobile Data Strategy, which pointed out serious flaws in the UK calculations of the spectrum required for mobile data. Furthermore, Avanti is concerned that the benefits to the UK which arise from satellite services are not fully considered. These benefits include those arising from the

economic benefits from the UK space industry – which in most cases rely on the availability of adequate spectrum - and the benefits to UK citizens and consumers. The benefits to UK citizens and consumers may be direct in some cases – for example in the case of satellite TV services or rural broadband access, or may be secondary in other cases, for example in the case of satellite for TV distribution or in the case of satellite feeder links to support safety-of-life communications on ships (e.g. GMDSS) and aircraft and aircraft (e.g. AMS(R)S).

Avanti is concerned that the high priority given by Ofcom to meeting the spectrum needs for terrestrial mobile broadband is not justified and could lead to an unnecessary and negative impact on other radio services – in particular space services and satellite services. This is particularly relevant where terrestrial mobile broadband and space services compete for the same frequency bands.

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

Avanti notes Ofcom’s proposed prioritisation of the agenda items. Avanti believes that Agenda Item 7 should be treated as High Priority. Past WRC experiences show that AI7 had always have lots of controversy and any unnecessary changes on AI7 could have irreversible damage on satellite industry and services.

#### AI 1.1

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

No, Avanti does not agree with Ofcom’s general approach. Avanti supports the ESOA position.

Due to the above, Avanti is of the view that bands that Ofcom is considering in section 4.7, and which would lead to interference to satellite services (i.e, 3 400-4 200 MHz, 5 725-5 925 MHz and 5 925-6 425 MHz), should not be further considered, and should not be proposed as candidate bands under AI 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?**

With regard to the 5925 – 6425 MHz band, Avanti has concerns about the usage of this band by IMT terrestrial as this frequency range is extensively used by satellites networks in the fixed satellite service (FSS) for Earth-to-space communication. FSS networks typically provide service to large regions encompassing the territory of multiple administrations. FSS satellite receives would be exposed to unacceptable and harmful interference from the cumulated aggregate emissions of IMT terrestrial transmitters. The IMT terrestrial systems in this band would have to cope with potential

interference coming from FSS uplinks, which would require sophisticated mitigation techniques. The risk with the deployment of IMT terrestrial is that it can lead to a “freeze” on FSS earth station licensing and action taken to phase out C-band FSS services from these bands.

The case for RLAN is entirely different. Although it is mentioned by Ofcom in that RLAN in this band would be as a substitute of frequency bands in the 5 GHz range, no studies have been performed within ITU-R or elsewhere for RLAN deployment the band 5 925-6 425 MHz. This band was also not identified by ITU WP5A as a suitable frequency range for RLAN, and was not proposed by any administration to be considered for RLAN. Due to the need for RLAN to have globally harmonised bands to operate in, and the lack of international support, it seems very unlikely that this band can be considered under AI 1.1 for RLAN.

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?

No comment.

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?

No comment.

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?

Avanti supports the ESOA position.

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?

Avanti does not agree with any longer term consideration of the band 3 800-4 200 MHz for potential mobile broadband use. Not only is there strong opposition from within CEPT, there is strong opposition worldwide to such development. This opposition will make any harmonisation of this band for mobile broadband use very unlikely, and Ofcom should actively support a “NOC” position for this band.

Additionally, it is worth mentioning the most recent conclusions of the EU Commission in light of

their recent spectrum inventory:<sup>1</sup>

*“Decision 2008/411/EC harmonised the 3400-3800 MHz band for terrestrial systems but its use for wireless broadband is currently low. The probable use for small cells makes capacity constraints for wireless broadband in this range unlikely. The level of under-utilised spectrum for mobile broadband is still significant – approximately 30%, mainly but not exclusively in the 3.4- 3.8 GHz range due to lack of demand and/or linked to usage difficulties.*

*The increase in satellite bandwidth required for backhaul and trunking services, professional services, and the continuously increasing bitrates used for video distribution will be the main trends pushing satellite spectrum demand upwards and that most of those needs may be met by the C-band.*

*This is a valuable band for satellite use as it contains quite a large amount of spectrum at relatively low frequencies which have superior propagation characteristics (allowing very wide coverage) and are less susceptible to rainfall and humidity (enabling signal resiliency) than higher satellite frequencies. There are over 180 satellites providing C-band services and at least 50 of these cover Europe, where this band is used mainly by professional services, due to the high cost associated with the equipment required to operate in such a band. There are around 1400 ground sites in the EU communicating bi-directionally with C-band satellites.*

*The Commission considers that demands to allow terrestrial wireless broadband services in the whole C-Band (i.e. in 3.8-4.2 GHz as well as 3.4-3.8 GHz) would not be justified.”*

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?

No comment.

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?

Avanti opposes the identification of the band 5 350 – 5470 MHz to RLANs. Avanti believes the requirements of the EESS services (including for GMES/ Kopernicus) should be given higher priority. Avanti believes Ofcom’s proposals for RLAN sharing with EESS in this band are naïve, unenforceable and will lead to a catastrophic and irreversible negative impact on EESS systems such as Kopernicus which are crucial to means for monitoring the effects of Climate Change.

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<sup>1</sup> Commission Report on the Spectrum Inventory, COM(2014)536

Ofcom's continued advocacy of proposals on the 5350 – 5470 MHz band for RLAN use is wholly inconsistent with the UK Government's long standing policy stance on taking step to measure the effects of Climate Change and to mitigate the effects of Climate Change.

It is important to note that in the ITU-R context, whilst there have been many studies in the band 5 350-5 470 MHz, there have been no studies performed in the band 5 725-5 850 MHz with respect to sharing between RLAN and FSS. Within CEPT there have been some initial studies so far which indicate that sharing between existing services and RLANs may not be feasible. The RLAN community would have to provide information on how any mitigation measures could improve the sharing situation. Further studies are currently on-going within CEPT. However, Avanti is of the view that no solution in the band 5 725-5 925 MHz should be considered within the WRC context.

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

No comment.

#### Agenda item 1.2

[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?](#)

No comment.

#### Agenda item 1.3

[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?](#)

Avanti supports the UK position.

#### Agenda item 1.4

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

No comment.

#### Agenda item 1.6

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?

The question does not specify whether such further studies on the demand and justification would be for the use of the spectrum of additional FSS allocations and/or for the existing services. In any case, Avanti believes that existing services must be accommodated such that undue constraints are not imposed.

Avanti strongly supports the identification of additional primary allocations to the FSS in frequency bands between 10 and 17 GHz, as they are required to support the growth in services and the continued connectivity commitments of FSS systems. The new allocation should be continuous and contiguous with the existing FSS allocation, to the extent possible, and a worldwide allocation is supported.

Avanti agrees that any additional primary allocation to the FSS should ensure compatibility with existing services, and while identifying suitable allocations ensuring such compatibility is a challenge, a number of studies are currently underway to identify both uplink and downlink allocations.

Current studies indicate that an additional co-primary FSS uplink allocation could be accommodated within the 14.5-14.8 GHz band. Avanti believes a new allocation can be accommodated in this band and should be supported.

Current studies also indicate that an additional co-primary FSS downlink allocation in the 13.25-13.75 GHz band (for example 13.4 – 13.65 GHz) could be accommodated and should likewise be supported.

#### Agenda item 1.7

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?

Avanti supports the ESOA position.

#### Agenda item 1.9.1

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?

The agreement found at CEPT level is reflected on the European Common position as well as on the CEPT brief which contains only one method consisting on the allocation of 2×100 MHz to FSS, with some restrictions, to satisfy Agenda Item 1.9.1. This European Common position is the result of numerous detailed technical studies held to ensure the protection of incumbent services.

Based on this, Avanti is of the view that UK should support the new primary allocation of 2x100 MHz for the fixed-satellite service in the 7/8 GHz bands.

#### Agenda Item 1.10

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?

Avanti does not support new allocations to MSS in this frequency range. The Avanti position for this frequency range is “No Change”.

The EDRS systems operating in this band should be protected. Avanti is a partner in the ESA EDRS project and according has a direct interest in EDRS use of the EESS and ISL bands in the 22 – 26 GHz range.

#### Agenda Item 1.5

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?

Avanti operates FSS networks in the Ka-band frequencies. Avanti will be providing services to support future developments for Unmanned Aircraft (UA) systems. Some UA systems are currently making use of FSS networks for control of UA beyond line of sight and for transmission of payload data from UA to ground. Agenda item 1.5 is focussed on provisions to allow for operation of UA in *non-segregated* airspace, and for such use it is clear that safety considerations are of paramount importance.

At the current time, the specific performance requirements for UA systems when operating in non-segregated airspace are not developed by the aviation authorities. However ESOA members have been contributing to the technical studies within the ITU-R to assess the performance of UAS systems that should be expected when operating in the Ku-band and Ka-band FSS bands. In para 5.5 of the consultation document, Ofcom states: *“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”*. While the performance requirements for UA systems are not defined, it is not possible to fully answer the question of whether FSS spectrum allocations meet the UA requirements. However, there appears to be no impediment from the technical perspective to the introduction of provisions in the RR to permit the operation of UAS in non-segregated airspace.

Considering that Ofcom has no direct role in aviation regulation, but is concerned with optimal use of the radio spectrum (as stated in para 5.5 of the consultation document), we consider that the UK approach to this agenda item at WRC-15 should also focus of allowing for the optimal use of the

spectrum in the Radio Regulations, leaving matters related to aviation regulation to ICAO and other aviation regulation authorities.

An important issue is the allocation under which UA systems would operate. Avanti opposes any form of allocation to the AMS(R)S in these FSS or MSS frequency bands above 3.4 GHz as this could lead to new and additional constraints on typical FSS applications.

Avanti believes that Ofcom could have misunderstood the view of ICAO on this issue in the consultation document (para 5.5). The ICAO position does not state that a specific AMS(R)S allocation is required for the operation of UA systems. On the contrary, the following reference to Recommendation 1/13 of the 12<sup>th</sup> Air Navigation Conference, which is included in the ICAO position in agenda item 1.5, clearly indicates that ICAO is open to studying the possibility of using existing FSS allocations for UA systems: “... ICAO support studies in the International Telecommunication Union Radio Communication Sector (ITU-R) to determine what ITU regulatory actions are required to enable use of frequency bands allocated to the fixed satellite service for remotely piloted aircraft system command and control (C2) links to ensure consistency with ICAO technical and regulatory requirements for a safety service”. While the position also states “That all frequency bands which carry aeronautical safety communications need to be clearly identified in the Radio Regulations”, it is clear that such an identification does not have to take the form of an AMS(R)S allocation. This issue has been further debated within the ITU-R including advice by legal department of the ITU and concluding explicitly that an allocation of AMS(R)S is out of the scope of the WRC 15 agenda item 1.5.

Avanti therefore believes the UK position should be for No Change to the Radio Regulations.

If changes to the RR are made by WRC-15 in response to this agenda item, Avanti is of the view that the following should apply:

1. There should be no AMS(R)S allocation.
2. There should be no specific spectrum segments or sub-bands identified for UAS CNPC links within the current FSS allocations.
3. If UAS CNPC links are permitted in the FSS bands, they should receive no higher regulatory status or no higher regulatory or technical protection than other FSS applications and would be coordinated under the normal provisions for coordination of satellite networks under Article 9 and 11 of the Radio Regulations.

#### Agenda Item 1.8

[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?](#)

Avanti supports the ESOA position.

#### Agenda item 1.9.2



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?

No comment.

#### Agenda Item 1.15

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?

No comment.

#### Agenda Item 1.16

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

No comment.

#### Agenda Item 1.17

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?

No comment.

#### Agenda Item 1.18

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?

No comment.

#### Agenda item 1.11

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?

No comment.

#### Agenda item 1.12

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?

No comment.

#### Agenda item 1.13

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?

No comment.

#### Agenda item 1.14

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?

No comment.

#### Agenda Item 7

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

Avanti endorses recent positions of UK at CEPT CPG PTB (See Annex 1). Avanti recommends that OFCOM continues to advocate its current position.

AI 7 is evolving regarding the priority issues which both WP 4A and the Special Committee (SC) are taking on board. The recent WP 4A meeting has selected a number of issues and some others might likely be added in the upcoming SC. In addition, CEPT may have additional views and issues at its upcoming September PT B meeting.

#### Agenda Item 9.1, issue 9.1.1

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?

No comment.

Agenda Item 9.1, issue 9.1.2

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

Avanti endorses recent positions of UK at CEPT and ITU levels (See Annex 2) and would anticipate OFCOM continues its current position.

Since the issue 9.1.2 is considered complex by many administration, WP 4A may need to prioritise its mutual efforts to succeed in achieving consensus regarding appropriate changes. As shown in Section 4.1 of Annex 7 of Document 4A/468 the advantages in the reduction of the number of satellite networks affected when reducing the coordination arc is more evident than when modifying the protection criteria  $\Delta T/T$ .

The facts, based on the exercise studied by WP 4A are based on the following comparative results:

- The reduction of the coordination arc for C band to 6° would reduce the number of affected networks by 27% while the modification of the  $\Delta T/T$  (from 6% to 12%) would represent an improvement of 6% on the number of satellite networks.
- The reduction of the coordination arc for Ku band to 5° would reduce the number of affected networks by 50% while the modification of the  $\Delta T/T$  (from 6% to 12%) would represent an improvement of 31% on the number of satellite networks.

In addition, the coordination arc generates mandatory coordination cases while  $\Delta T/T$  is used as criteria by administrations who take the initiative to be included in coordination. Avanti proposes to support a reduction of the coordination arc in C and Ku-band to avoid unnecessary coordination while ensuring sufficient protection of existing systems. A coordination arc of 6 degree is proposed for C-band and 5 degree for the Ku-band.

The reduction of the coordination arc for Ka-band seems not any urgent action for short term studies. Studies for further consideration of the reduction of the coordination arc, together with other aspects (like emission limits for example), in the Ka-band are invited to be carried out by ITU-R aiming at a possible decision by a future conference.

Avanti proposes to maintain DT/T criterion which means NO CHANGE

Reason for choosing NOC for technical criteria of DT/T: BR Director report (document number 4A/579-E ) on 27 June 2014 to ITU WP4A meeting on “*Technical criteria used in application of RR No. 9.41 in respect of coordination under RR No. 9.7*”, represents BR analysis on the “*effectiveness and appropriateness*” of the current DT/T criterion used in the application of RR No. 9.41. In this document, Bureau after a detailed analysis of the matter concludes that the C/I criterion alone for identifying potentially affected administrations / networks under RR Nos. 9.7 and 9.41 would not significantly reduce coordination requirement unless other issues as identified in section 2.3.2 of the Annex 7 to Document 4A/468, relating the representative range of the technical parameters are considered as well.

Results of simulation clearly demonstrates that the orbital separation required to establish coordination requirement using C/I criterion would not significantly improve the situation in the absence of any other mechanism that could address issues of unrealistic link parameters and hence consideration could be given to the appropriate means which would either directly or indirectly lead to the limitation of wide distribution of the characteristics of the filings. Without these measures properly considered and studied, the Bureau considers that simple transition to another coordination trigger would not address the problem of “effectiveness and appropriateness” of the existing and proposed criteria while increasing the workload of the Bureau to implement the changes and the process.

Agenda Item 9.1, issue 9.1.3

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?

Any such proposal need to be studied carefully and commented. Avanti cannot comment this issue before studying the real proposal with due care.

Agenda Item 9.1, issue 9.1.4

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?

No comment.

Agenda Item 9.1, issue 9.1.5

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?

No comment.

Agenda Item 9.1, issue 9.1.6

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?

Avanti strongly supports the UK position.

#### Agenda Item 9.1, issue 9.1.7

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?

Avanti supports the CEPT position.

#### Agenda Item 9.1, issue 9.1.8

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?

Avanti supports the UK position.

#### Agenda Item 9.2

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

Avanti believes that Ka-band ESOMPs will cause serious interference difficulties to Ka-band FSS services.

Avanti does not consider any requirement for any changes in RR to treat ESOMP beyond that prescribed in the current ITU Radio Regulations.

Avanti does not think the UK should attempt to circumvent the present ITU RR Article 5 allocation structure in Ka-band to MSS. MSS allocations are on a secondary basis in 2 X 400 MHz of the Ka-band at 19.7 – 20.1 / 29.5 – 29.9 GHz for the ITU Regions 1 and 3. Avanti opposes any direct or indirect / back-door changes to this regulatory structure.

If action is taken on this matter, Avanti proposes that:

- This should be considered at WRC-2018
- This would be coupled ITU regulatory provisions to ensure hard limits on ESOMP off-axis emission in Ka-band.

In the interim period until WRC\_2018, further efforts should be made in ITU-R WP-4A to establish relevant ITU Recommendation on off-axis EIRP density limits ESOMPs for GEO systems. Administrations and operators should carefully consider the need for the scope of potential action at WRC-2018 in the light of actual experience (including effects of interference from ESOMPs) gained in this interim period.

### Agenda Item 9.3

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

No comment.

### Other standing Agenda items

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

No comment.

### Future WRC Agenda items

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

Avanti opposes any proposal to have an agenda item for future WRC regarding the establishment of a new regulatory framework for NGSO systems operating in the FSS in the 37.5 – 51.4 GHz band.

On the matter of the potential for IMT and other mobile broadband applications above 6 GHz, Avanti has provided its comments in the answer to Question 44 below. At the current time, Avanti does not have further views on other proposed agenda items identified by Ofcom but may have as they evolve.

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

No comment.

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?

Avanti believes that it is very premature to consider a new agenda item for WRC-18/19 related to IMT above 6 GHz considering the following:

- a) there is no adequate justification for IMT spectrum requirement above 6 GHz;
- b) many of the frequency bands currently identified for IMT terrestrial below 3 GHz are not used or not used efficiently;
- c) there are many major technical challenges to the use of such high frequency bands above 6 GHz for terrestrial mobile systems;
- d) There are no ITU approved IMT terrestrial radio interfaces for bands above 6 GHz;
- e) Any identification/allocation above 6 GHz in primary satellite bands for IMT will jeopardies present and future usage of the satellites services.

- f) Sharing between Satellite and IMT terrestrial is not feasible. The introduction of IMT terrestrial in all other bands has invariably led to the displacement of other incumbent radio services and there is no reason to suppose the same would occur if IMT terrestrial was allocated or identified spectrum above 6 GHz.

Furthermore based on the outcome from the Ofcom Statement on Mobile Data Strategy for the next 10 years, Ofcom clearly points out there are a range of other potential solutions to meeting the growth in demand of IMT, such as deploying small cells, off-load to RLAN networks and the use of more efficient technologies.

Avanti find it highly regrettable that the UK Government (inter-alia DCMS and Ofcom) is considering taking action at WRC-2015 to propose an agenda item at WRC-2018 to address an allocation or identification to frequency bands including within 27.5 – 31.0 GHz and 17.3 – 21.2 GHz bands to future IMT terrestrial systems / services. Avanti finds it deeply concerning that Ofcom seems to be perpetuating spectrum allocation and spectrum use policies which fundamentally jeopardise the viable existing and future use of ITU satellite service allocations by satellite services.

Avanti considers that any action by Ofcom to propose an agenda item at WRC-2018 to address an allocation or identification within 27.5 – 31.0 GHz and 17.3 – 21.2 GHz bands to future IMT terrestrial systems / services would severely jeopardise and seriously prejudice Avanti's existing and planned Ka-band commercial services and investments. Avanti therefore strongly opposes such Ofcom / UK actions. Avanti notes that the Ofcom Mobile Data Strategy also points out that a key part of the preparatory work for the next 10 years is to ensure that the interest of ALL spectrum users, including assessing the potential for harmful interference to existing spectrum users is taken into account.

IMT terrestrial systems are a subset of the larger class of mobile broadband systems – not all mobile broadband systems meet the IMT requirements – and therefore the criteria for determining technical feasibility for IMT is far more extensive than that for generic mobile systems, for example, one of these is the level of mobility that can be supported (pedestrian speed? vehicular speeds? etc...) in bands above 6 GHz. All these elements need to be considered before a technology can even be considered technically feasible from a physical perspective. And this is without counting the radio aspects of IMT systems (i.e. interface standards) which need to meet the requirements found in various ITU Recommendations and Reports. For example, the current IMT radio interfaces have been extensively evaluated and shown to achieve these IMT objectives and requirements for IMT terrestrial in bands below 3 GHz. Therefore to which extent can these IMT radio interfaces be implemented in bands above 6 GHz?

The latter point above means that sharing studies that would likely be required for a WRC-18/19 agenda item could not be meaningful, as there can be no confidence in the technical and deployment characteristics of the IMT systems.

Avanti would like to emphasise that:

- a. The frequency bands above 6 GHz and below 31 GHz are well used by a large number of services, including satellite communication systems, mostly operating in the C-band, Ku-band and Ka-band frequencies.

- b. Many satellite system operators around the world currently operate/ plan to operate global or regional satellite services using specially Ku and Ka band frequencies. These satellite networks do and will provide valuable services in the UK and in many regions around the world and are also enablers for terrestrial operators. For example, Arabsat, Avanti, DirectTV, Echostar, Eshailsat, Eutelsat, Gascom, Inmarsat, Intelsat, Nilesat, Nigcomsat, O3B, RSCC, SES, Telenor, Telesat, Thaicom, Turksat, Viasat, Yahsat, Brazil government, Australian government, French government, etc etc,) all operate or will operate in the near future Ka-band satellite systems within the 27.5 – 30.0 / 17.7 – 20.2 GHz bands.
- c. UK-based Ka-band satellite operators and Ka-band satellite operators filing through the UK Administration for Ka-band satellite systems in the 27.5 – 30.0 / 17.7 – 20.2 GHz bands include Avanti, DirectTV, Echostar, Inmarsat, O3B, Telesat, and Viasat. The current level of investment from these satellite operators in Ka-band systems is already well over US\$ 5 billion and that level of investment is expected to radically increase in the coming few years. Avanti alone has already committed over US\$ 1 billion to Ka-band satellite systems.
- d. Additionally, satellites are often the enablers for other broadband access technologies and billions of investment has already spent on the satellite networks.
- e. If the Ku-band or Ka-band frequencies were to be placed within the scope of any new WRC agenda item, that would create uncertainty for FSS operators, their customers and their investors. FSS systems may take 20 years from initial planning and funding, through to their end of life and during this period, regulatory certainty is required. Such regulatory certainty would be undermined by such a new WRC-2018 agenda item proposing to accommodate terrestrial IMT above 6 GHz.
- f. Avanti therefore does not see any need for the UK to support any new agenda item for IMT above 6 GHz. Taking a driving role could effectively commit the UK into supporting the identification of spectrum above 6 GHz for IMT at a time when there is a lot of uncertainty about the need for and feasibility of such identification for IMT. There is also very likely to be conflicting UK interests in any candidate band.

Avanti believes – as is mentioned in the Ofcom Mobile Data Strategy Section 4.8 - that the issues is at a very early stage and further consideration will be necessary to understand which bands or which ranges of bands it will make sense to focus upon, but taking action at WRC-2018 on accommodation of yet to be determined and assessed IMT terrestrial requirements without investigating the most appropriate way to safeguard applications that currently use these bands is premature. However, if the studies are supportive of such a step, this matter could be placed as a preliminary agenda item for WRC-2021.

**Avanti recommends that until there are vetted IMT radio interfaces and specific/mature/widely accepted IMT systems characteristics in bands above 6 GHz that can be used in sharing studies to assess compatibility, there cannot be an agenda item to modify the table of allocations. IF there is properly validated requirement for additional spectrum for terrestrial IMT above 6 GHz, and the technical feasibility for such IMT systems is mature and has been fully vetted and demonstrated, any consideration on candidate frequency bands for IMT terrestrial should be considered at WRC-2021 (i.e. not WRC-2018), be limited in scope to frequency bands above 31.0 GHz and be focussed**



**outside the frequency bands allocated by the ITU on a primary or co-primary basis to satellite services.**

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**5<sup>th</sup> meeting CPG-15 PTB  
Copenhagen, 9-12 September 2014**

**Date issued:** 01 September 2014  
**Source:** United Kingdom  
**Subject:** Proposal for Agenda item 7  
**Password protection required:** No

**Summary:**

Agenda Item 7 considers possible changes with respect to 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.

Regarding several issues of AI 7, the July 2014 meeting of WP 4A concluded its development of draft CPM text and forwarded this text for inclusion in the draft CPM Report to CPM15-2. WP 4A then changed the labelling of some of the issues.

In this paper, the United Kingdom offers a table for the consideration of CPG PTB presenting the UK view on all the issues included in the draft CEPT Brief agreed at CPG14-5 as well as the issues in the output documents from the July 2014 meeting of WP 4A. The table is based on the structure, labelling and methods agreed by WP 4A.

**Proposal:**

This paper indicates the United Kingdom views on different issues of AI 7 as below and proposes to align the preliminary CEPT positions on each issue with these views, i.e. express support for the CPM Methods described in the below table.

Issue	Definition	CPM Proposed methods	UK View
A	Informing the Bureau of a suspension under RR No. 11.49 beyond six months	A1 – No Change A2 – Option A- Day-for-day reduction after 6 months Option B - Day-for-day reduction after 6 months up to 12 months followed by two times reduction thereafter	Method A2 option A
B	Publication of information on bringing into use of satellite networks at the ITU website	B1 - On receipt of the information, the Bureau shall publish it in the BR IFIC. B2 - On receipt of the information, the Bureau shall publish it in the BR IFIC and make it available on the ITU website B3 - NOC	Method B2
C	Review or possible cancellation of the advance publication mechanism for satellite networks subject to coordination	C1 - No change C2 - Suppression of the API for satellite networks subject to coordination C3 - Changing the period before expiry of the API for satellite networks subject to coordination C4 - Suppression of the current API mechanism and generation of API at the receipt of a coordination request C5 - Suppressing the six-month minimum period between the date of receipt of an API and the date of receivability of the associated coordination request	Method C5
D	General use of modern electronic means of communications in	D - modern electronic means can be used instead of “telegram”, “telex” or “fax” and implement a consolidated approach for both the submissions	Method D

	coordination and notification procedures	of satellite network filings and their related correspondence if appropriate	
E	Failure of a satellite during the ninety-day bringing into use period	<p>E1 - in case of a failure of a satellite during the ninety-day BIU period, the corresponding frequency assignments shall be considered as having been brought into use.</p> <p>E2 - in case of a failure during the ninety-day BIU period of a satellite, used for bringing frequency assignments back into use, the corresponding frequency assignments will be considered as having been brought back into use</p> <p>E3 - No change</p>	Method E3
X	Review of the orbital position limitations in Annex 7 to RR Appendix 30	X1 - Suppression of Orbital position limitations in Region 1(further west than 37.2W or further east than 146° E), Region 2 (further west than 54W or 44W or 175.2W in different bands).	Method X1
Y	Possible method to mitigate excessive satellite network filings issue	<p>Y1 – Setting milestones for the satellite network status based on the practical facts relating to manufacturing and launching process of satellite payloads in a new PARTXS and Resolution 49 information without BR examination</p> <p>Y2 – same as Y1 but with BR examination</p> <p>Y3 – Removal of six months requirement between API and CRC</p>	Method Y3
[XX] Issue C in the CPG 15-4 draft CEPT Brief	Transfer into the Radio Regulations of the Rule of Procedure regarding suspension of a frequency assignment in the List in Appendix 30B	<p>C1 – make necessary modifications</p> <p>(CEPT supports transfer of the Rule of Procedure into AP30B of the Radio Regulations) developed at the Working Party of the Special Committee in December 2013.</p>	Method C1
[YY] Issue C in the CPG 15-4	Comprehensive review of radio regulatory process under WRC-15 agenda item 7	No methods have been proposed.	NOC

ECC/CPG15

CPG PTB(2014)049



**5<sup>th</sup> meeting CPG-15 PTB  
Copenhagen, 9-12 September 2014**

**Date issued:** 01 September 2014

**Source:** United Kingdom

**Subject:** Proposal for Agenda item 9, Issue 9.1.2

**Password protection required:** No

**Summary:**

This agenda item deals with the 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.

In the light of recent BR Director report (document number 4A/579-E) on 27 June 2014 to WP4A meeting on “Technical criteria used in application of RR No. 9.41 in respect of coordination under RR No. 9.7”, this document proposes to adopt No Change to this agenda item.

## **Proposal:**

As explained below in our document, the United Kingdom proposes that:

- in line with the BR conclusion, **UK does not support replacing  $\Delta T/T$  criterion by a C/I criterion** in applying RR No. 9.41.
- the value of the  $\Delta T/T$  threshold **remains unchanged at 6%**, until ITU-R studies can demonstrate via a new ITU-R Recommendation that a different value can be acceptable.
- on the issue of reduction of arc, **UK proposes that the size of coordination arc at Ka-band remains unchanged at 8 degrees.**

## **Background**

### **1. $\Delta T/T$ to be kept as method used under RR 9.41 examination**

BR Director report (document number 4A/579-E ) on 27 June 2014 to ITU WP4A meeting on “Technical criteria used in application of RR No. 9.41 in respect of coordination under RR No. 9.7”, represents BR analysis on the “effectiveness and appropriateness” of the current  $\Delta T/T$  criterion used in the application of RR No. 9.41. In this document, Bureau after a detailed analysis of the matter concludes that the C/I criterion alone for identifying potentially affected administrations / networks under RR Nos. 9.7 and 9.41 would not significantly reduce coordination requirement unless other issues as identified in section 2.3.2 of the Annex 7 to Document 4A/468, relating the representative range of the technical parameters are considered as well.

Results of simulation clearly demonstrates that the orbital separation required to establish coordination requirement using C/I criterion would not significantly improve the situation in the absence of any other mechanism that could address issues of unrealistic link parameters and hence consideration could be given to the appropriate means which would either directly or indirectly lead to the limitation of wide distribution of the characteristics of the filings. Without these measures properly considered and studied, the **Bureau considers that simple transition to another coordination trigger would not address the problem of “effectiveness and appropriateness” of the existing and proposed criteria while increasing the workload of the Bureau to implement the changes and the process.**

Use of the C/I approach for RR 9.41 examination has the following disadvantages:

- **It does not reduce number of 'triggered coordinations' in practice.** The C/I calculation at the RR 9.41 stage will be undertaken using the  $C_{max}$  of the interfering carrier and the  $C_{min}$  of the victim carrier and due to the wide range between  $C_{max}$  and  $C_{min}$  carrier values filed in the AP4 / CRC information for C/Ku/Ka band satellite systems, one will invariably end up with the same set of potentially affected networks identified, whether or not the calculation based on C/I or  $\Delta T/T$ .
- **It will be lead to substantial increase in the work load of Administrations and satellite operators** to provide C/I calculations for no significant gain.
- **The use of C/I at the RR 9.41 stage will likely lead to an increase in BR processing and analysis effort** which will then likely be reflected in an increase in cost recovery fees charged by the ITU-RB to Administrations and their satellite operators.

As such the UK believes that  $\Delta T/T$  should be kept as method used under RR 9.41 examination.

## **2. Threshold value of $\Delta T/T$ kept at 6%**

With regard to the value of the  $\Delta T/T$  criterion, satellite links are typically designed with about 1 dB of interference margin, equivalent to a  $\Delta T/T$  of approximately 25%. This is also consistent with current ITU-R Recommendations. Changing this value will certainly bring about unintended consequences for existing satellite systems which will not be able to cope with changes to an unplanned increase interference noise. The UK thus believes that in order to change this threshold appropriate ITU-R studies need to be performed and agreed.

Based on this, a single-entry coordination trigger of  $\Delta T/T=6\%$  remains appropriate, until ITU-R studies can demonstrate via a new ITU-R Recommendation that a different value can be acceptable.

## **3. No reduction of coordination Arc at Ka-band**

On the issue of reduction of arc, the UK suggests that it is premature at this stage to reduce coordination arc at Ka-band from 8 degrees for FSS to FSS coordination as different studies at ITU-R WP4A mostly contradicting each other and so far no compelling reason on reducing coordination arc has been suggested.