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OneWeb response to Ofcom's consultation on UK preparations for the World Radiocommunication Conference 2019 (WRC-19)

OneWeb Communications Ltd. ("OneWeb") are pleased to provide these comments in response to the recent Ofcom consultation "UK preparations for the World Radiocommunication Conference 2019 (WRC-19)".

Yours sincerely,



Pablo Zurdo Santos
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OneWeb

Question 1: *Do you agree with the prioritisation of the agenda items, as shown in Annex 5, and if not why?*

We encourage Ofcom to consider elevation of Agenda Item 1.6 to medium priority. The outcome of this agenda item will be instrumental in ensuring an efficient use of the 50/40 GHz spectrum by satellite services and in realizing the benefits that the broadband services to be provided in these bands will bring to UK consumers.

As the work on this agenda item has developed in the ITU-R process, a couple of issues that could impede a successful outcome have become apparent. These are explained in detail in our response to Question 9. A more active participation of the UK in the discussions on these two topics leading up to the WRC-19 is critical to ensure a positive outcome.

Question 2: *Ofcom is supporting the following three priority bands for IMT identification in the RRs:*

24.25 - 27.5 GHz

40.5 - 43.5 GHz (as part of a wider global 37-43.5 GHz tuning range)

66 - 71 GHz

If you don't agree with any of these bands, or think we should be promoting other bands, please provide justification for your views.

OneWeb is concerned with the use of the term “tuning range,” which is not the same as an “allocation/identification,” and allows individual countries or regions to use some parts of a “tuning range” for the service(s) allocated/identified at the ITU for that band, but not others. This creates a burdensome hurdle for multi-national technologies, such as satellite, which require globally-harmonized spectrum, or at a minimum harmonization across major regions – not nation-by-nation allocations. Thus, while the concept of a “tuning range” might seem at first to be fully positive, seeming to offer flexibility and respect for sovereign differences, in fact, a “tuning range” will likely lead to market inefficiencies in the delivery of satellite services, and the general decline in the availability of the most efficient technology for delivery of broadband services to remote and unconnected populations, as well as to air and sea mobility users.

That said, OneWeb can agree with the identification of these three bands for IMT under certain conditions, and provided appropriate actions are made in other bands as a consequence of supporting these three bands for IMT.

24.25 - 27.5 GHz:

Based on the IMT-2020 characteristics provided by ITU-R WP5D, the sharing studies by the ITU-R TG5/1 have shown that coexistence between IMT and FSS is feasible in this band, when FSS use is limited to a certain earth station deployment that is not ubiquitous. The expectation is that this band will be used primarily for feederlink earth stations so that the overland path sharing with IMT will be feasible.

These studies are based on some very specific assumptions, including: power levels of the IMT base stations limited to 48 dBm/200 MHz, very low antenna sidelobes (as per Rec. ITU-R M2101) and base stations with main beam always pointing below the horizon (except for very limited cases involving indoor

UEs). These three assumptions together create a very specific scenario with regards to the emissions of IMT in the direction of a satellite receiver. If the IMT technical and deployment characteristics deviate from the above three conditions, excessive interference into FSS satellites could occur. In such a case, interference reduction at satellite receiver after the deployment of IMT systems has taken place would be complicated, if not impossible, due to aggregate interference from a large number of IMT stations as well as the fact that a satellite footprint can cover territories of multiple administrations.

In this regard, some regulatory measures have been included in ECC Decision (18)06 to address long term protection of FSS satellites, such as:

- Requiring that the mechanical tilt of IMT base stations shall be below the horizon.
- Requiring that the main beam of IMT base stations should normally also be below the horizon.
- Requiring a regular update of the characteristics of IMT (including base station density) and the study of their impact on sharing and compatibility with other services. This would enable the recommendation of corrective measures to address situations whereby the interference threshold to FSS space stations would be at a risk to become exceeded. It is noted that such process would also be relevant to the continued protection of EESS passive band in the 23.6-24 GHz.

The regulatory measures included in the ECC Decision (18)06 should be the minimum regulatory measures adopted by WRC-19 for the 24.25-27.5 GHz and future draft WRC-19 Resolution to protect FSS in this band. Furthermore, OneWeb is of the view that appropriate in-band EIRP mask or TRP limits, along with a more explicit restriction on the IMT base stations' pointing, would have been needed to ensure the protection of FSS space receivers, as explained above. OneWeb will work with the satellite industry to continue developing such technical limits for consideration by WRC-19 and urges Ofcom to keep an open mind since, given the characteristics of the planned IMT deployments considered at TG5/1, these measures would pose no constraints on the deployment of IMT systems.

40.5 - 43.5 GHz:

The ITU-R studies have shown possibilities to achieve co-existence between IMT and other incumbent services under certain conditions. As far as the FSS is concerned, the coexistence in this range is different for the 40.5-42.5 GHz band, where the FSS allocation is space-to-Earth, and the 42.5-43.5 GHz band, where the FSS allocation is Earth-to-space. The required conditions for the allocation and/or identification of these two ranges for coexistence with the FSS are therefore different.

- For the 40.5-42.5 GHz band it is possible to upgrade the existing secondary mobile allocation to a primary allocation to the mobile service (except aeronautical mobile) in the Table of Frequency allocations in Region 1 and identify the frequency band for IMT within the land, and possibly maritime, mobile services by a new footnote with certain regulatory conditions.
- For the 42.5-43.5 GHz band, it is possible to identify the band for IMT within the land, and possibly maritime, mobile services in Region 1 by a new footnote with certain regulatory conditions. These should include appropriate in-band EIRP mask or TRP limits, along with a clear requirement for the IMT Base Stations to never point their main beams above the horizon. Absent such restrictions, the interference from IMT deployments into satellite receivers could be dramatically

different from that analysed within the TG5/1 studies and protection of the FSS would not be ensured.

For both bands (i.e. for both coexistence with FSS uplink and downlink) the ITU-R studies have shown that coexistence between ubiquitous deployment of small FSS Earth Stations and IMT is not feasible, as the required separation distances cannot be guaranteed. As such, Ofcom is invited to consider the need to maintain a necessary balance within the range 37-43.5 GHz between spectrum for IMT in 40.5-43.5 GHz and spectrum for deployments of FSS terminals in at least a portion of the 37-40.5 GHz band. In this regard, OneWeb urges Ofcom to:

- Support limiting the proposal to identify 40.5-43.5 GHz to IMT to Region 1, so that existing HDFSS identifications in other Regions are preserved, and
- Support no change to the RR in the band 37-40.5 GHz and maintenance of the Region 1 HDFSS identification in the band 39.5-40.5 GHz. In absence of NOC in this band, the position on AI 1.13 would not be balanced and would not preserve possibilities for existing services.

OneWeb notes that Ofcom is supporting within CEPT the idea of a global identification of the full 37-43.5 GHz band, based on the regulatory concept of “tuning ranges”. OneWeb is of the view that the UK should not urge the CEPT or the ITU WRC-19 to abandon efforts to identify harmonized bands for 5G networks and other services in favour of national approaches through a vague concept of “tuning ranges”. This concept is valid for manufacturers to develop chipsets that can tune across a wide-ranging swath of spectrum, but is not a good regulatory solution for the following reasons. Such a large range is likely not implementable by manufacturers, which will undoubtedly use multiple smaller ranges. Furthermore, this concept does not provide certainty to any of the services that share the band because IMT could be deployed differently in every country, even within one ITU radio or administrative region.

A global identification based on this concept would encourage individual countries to select which parts of the tuning range they desire for 5G, regardless of the decisions of other countries in the region. This would have fatal implications for the use of these band by satellite services. First, it would provide no certainty about which bands would be available to deploy satellite gateways and user terminals for years to come. Second, given the international nature of satellite services, it would likely make the full band unusable for satellite services as it is not possible to design the coverage of satellites to match the territories of countries or get the required protection from the 5G deployments of a neighbouring countries.

Based on this, we would ask Ofcom to reconsider its support for such a concept, both within the CEPT process and at WRC-19.

66 - 71 GHz:

The studies have shown possibilities to achieve co-existence between IMT and other incumbent services under certain conditions. OneWeb therefore supports identification of the frequency band 66-71 GHz for IMT in accordance with certain conditions in a WRC Resolution.

Question 3: *What are your views on the suitability of the currently identified bands for HAPs and do you think there is a requirement for additional spectrum? Recognising that we support 26 GHz as a global band for IMT under agenda item 1.13, what are your views on the bands currently under study for HAPs, both globally and in ITU-R Regions?*

OneWeb is of the view that any consideration of modifications to current identifications or new identifications for HAPS needs to ensure the protection of existing FSS systems and a viable sustainable access without undue constraints to the planned FSS services allocated in the considered bands.

In particular, given the results of the studies conducted within the ITU-R, HAPS should only be allowed to operate in the opposite direction of transmission in bands shared with FSS. For instance, no ground-to-HAP operations should be allowed in the current 27.9-28.2 GHz identification. Similarly, should WRC-19 decide to allow HAPS operations in the band 38-39.5 GHz, these should be limited to the ground-to-HAP direction. With regards to the 24.25-27.5 GHz band, OneWeb notes that HAPS and IMT might have difficulties to share, unless both applications are limited to separate geographical areas i.e. IMT to urban areas and HAPS to non-urban areas.

Question 4: *What are your views on the bands within scope of Agenda Item 1.16 and their suitability for Wi-Fi and Wi-Fi like services? Do you agree that Ofcom should support the CEPT position of No Change? If not, please provide evidence to support your view.*

OneWeb has no view on this item.

Question 5: *Do you agree that UK support the inclusion of the updated Recommendation M.1849-1 (“Technical and operational aspects of ground-based meteorological radars”) in footnote No.5450A? What are your views on the requirement to include a reference to ITU-R Recommendation ITU R M.1638 1 in footnotes No.5447A and 5.450A and the potential impact upon Wi-Fi (and similar technologies)?*

OneWeb has no view on this item.

Question 6: *Do you agree that UK support a position of not making changes to the Radio Regulations to reference specific bands for M2M/IoT usage?*

OneWeb supports the UK view not to make any change in the Radio Regulations under Agenda Item 9.1.8. OneWeb believes that such applications can be performed under the fixed and mobile services, and also in the various space services (FSS, MSS) without any further regulatory action.

Question 7: *What are your views on the potential removal of the limitations listed above?*

OneWeb has no view on this item.

Question 8: *What are your views on the approach we are proposing to take in respect of ESIMs and are there any additional factors that you think we should take into account?*

OneWeb supports the adoption of provisions in the Radio Regulations to allow operation of ESIM with GSO networks in the 17.7-19.7 GHz and 27.5-29.5 GHz bands, subject to appropriate technical and

regulatory mechanisms for aeronautical, maritime, and land ESIM operations designed to protect other allocated services and other FSS operations in the bands.

One factor that OneWeb would like Ofcom to take into account is the protection of non-GSO FSS systems in the 27.5-29.1 GHz band, and potentially up to 29.5 GHz. It is important to keep in mind that an ESIM communicating with GSO FSS does not qualify as an FSS application as per No. 1.21. Therefore, when considering regulatory and operational constraints for this type of communication link, proper consideration shall be given to the protection of all the radiocommunications systems allowed under the existing regulatory framework, irrespective of their status with respect to GSO FSS systems.

The proposed use of bands allocated to FSS for communications between ESIM and GSO FSS space stations is based on the understanding that ESIM will not create more interference to, nor require more protection from, other radiocommunication systems than fixed earth stations already operating with GSO FSS stations in the same frequency band. While ESIM terminals are expected to remain within the envelope of typical stationary FSS earth stations in the direction of the GSO arc – ensuring the above condition – their performance in directions away from the GSO arc differs significantly from that of typical FSS static earth stations. The sharing between ESIM and non-GSO FSS systems therefore requires specific regulatory mechanisms.

Unfortunately, the studies conducted prior to WRC-15 that led to the adoption of Resolution 156 (WRC-15) do not appear to have considered the ESIM antenna patterns in directions away from the GSO arc, because the e.i.r.p. density values for ESIM in the Annex to this Resolution are only specified for directions “within 3° of the GSO” arc. Ofcom is encouraged to ensure that the protection of non-GSO FSS systems is not omitted this time. In particular, because unlike in the 29.5-30 GHz band, where No. 22.32 applies, there are no provisions in the Radio Regulations that would limit the uplink emissions of ESIM operating with GSO FSS networks in the 27.5-29.5 GHz band.

OneWeb would like to draw Ofcom’s attention to the situation in the 28.6-29.5 GHz band, where GSO and non-GSO coordination applies under RR 9.11A. The fact that the band is subject to coordination is no guarantee that non-GSO operators will get the required protection from ESIM, especially from ESIM operating with GSO FSS networks having ITU priority over the non-GSO system, nor that the interference will remain unchanged once ESIM are allowed in the band. Regardless of the characteristics currently contained in GSO FSS network filings – which in some cases may include combinations of small, poorly performing antennas with very high power levels to mimic the off-axis characteristics of ESIM – the reality is that the interference that a non-GSO system will receive from an ESIM operating in this band will be higher than that from the typical stationary earth stations that today communicate with GSO FSS networks. Consequently, irrespective of any limits that might be agreed between operators during coordination discussions, ESIM operating in this band should be asked to comply, as a minimum, with the limits established for the 27.5-28.6 GHz band.

OneWeb would therefore encourage Ofcom to support the adoption of the emission limits for ESIM in the 27.5-29.1 GHz band for the protection of non-GSO FSS operations in line with the outcome of the ITU-R studies; that is to adopt EIRP density limits along the lines of Rec. 524-9 or RR No. 22.32 or, for those ESIM unable to comply with typical off-axis emission limits, a maximum EIRP per ESIM transmitter in the order of 55 dBW, for ESIM carrier bandwidths up to 100 MHz and using a scaling function for larger bandwidth carriers.

Question 9: *What are your views on the establishment of regulatory provisions, in Article 22, that cover non-GSO operation between 37.5 and 51.4 GHz?*

As mentioned in our response to Question 1, we encourage Ofcom to consider elevation of this agenda item to medium priority.

OneWeb supports the establishment of a regulatory framework for the operation of non-GSO FSS systems in the bands 37.5-39.5 GHz (s-E), 39.5-42.5 GHz (s-E), 47.2-50.2 GHz (E-s) and 50.4-51.4 GHz (E-s). As the satellite industry moves forward with the development of systems in these bands, a transparent and predictable regulatory regime is required to unlock the full potential that these high frequency, large bandwidth allocations offer.

In preparation for WRC-19, the ITU-R has conducted extensive studies under AI 1.6 and has concluded that compatibility between non-GSO satellite systems and GSO FSS/BSS networks in the 50/40 GHz band is achievable. The studies have also concluded that developing efd limits based on the operational parameters of specific systems – as done in the past – results in spectrum inefficiencies and unduly restricts the design and operation of non-GSO systems. Alternatively, the ITU-R has developed a more efficient sharing methodology that establishes limits in the increase in unavailability of GSO links caused by the operation of non-GSO systems as a protection or sharing solution. This will allow for maximum flexibility in the design and operation of non-GSO systems, while fully protecting GSO FSS systems in this band. In this regard, it is worth noting that no efd masks have been developed in the ITU-R studies under AI 1.6 and that the draft CPM text does not include any method proposing to include efd limits for the 50/40 GHz band in Article 22 as a regulatory solution this agenda item. Therefore, OneWeb urges Ofcom not to pursue efd limits and oppose any proposal for such limits, as they would not have been studied by ITU-R.

OneWeb instead proposes that the UK support methodologies, in the draft CPM text on AI 1.6, that utilize a single-entry increase in unavailability caused by non-GSO interference, along with an aggregate protection limit in increase in unavailability, to address considerations in Article 22 as a regulatory solution for protection of GSO systems in the 50/40 GHz band.

The ITU-R has also conducted studies to assess the need to update the limits in Resolution 750 (Rev. WRC-15) to protect EESS (passive) in the 50.2-50.4 GHz band. These studies conclude that the unwanted emission limits for FSS earth stations need to be lowered by as much as 50 dB with respect to the limits currently in Resolution 750 (Rev. WRC-15). The reason for such a conclusion lies in the way that the studies have been conducted. The studies do not properly model the most sensitive EESS (passive) sensor, the so-called push-broom sensor – which leads to interference overestimation – nor do they employ mitigation techniques other than power reduction. OneWeb is of the view that such studies cannot be the basis for an update to Resolution 750.

While OneWeb is supportive of an update to the limits in Resolution 750 to protect EESS (passive) operations in the 50.2-50.4 GHz band, we are of the view that that the limits proposed so far are unnecessarily low and will unduly constrain the non-GSO FSS use of the 50/40 GHz bands. OneWeb would like to note that the unwanted emissions limits currently proposed in the draft CPM text for AI 1.6 would result in the loss of about 1 GHz of spectrum (500 MHz each side of the EESS band) in guardband, once the necessary filters are integrated at the non-GSO FSS Earth station. Strangely, due to political considerations, there is no proposal to reduce the limits applicable to GSO FSS Earth stations, so the non-GSO system would bear the brunt of passive sensor protection.

In this regard, OneWeb is currently developing analyses to study both the interference of the planned non-GSO systems on the EESS (passive) operations as well as the impact of the proposed updates to the unwanted emission limits on the usability of the 50/40 GHz band by FSS systems. OneWeb would encourage Ofcom to be involved in this discussion and to support an update to Resolution 750 that ensures protection of the EESS (passive) without unduly constraining the deployment of non-GSO FSS systems in the adjacent bands.

Question 10: *What are your views on the various issues under consideration under Agenda Item 7, particularly in respect of the bringing into use of non-geostationary satellite networks (i.e. Issue A)?*

The following are OneWeb's views on Issue A.

OneWeb is of the view that the Bringing into Use (BIU) of non-geostationary (non-GSO) satellite systems should be revised and redefined at WRC-19. As already identified by the Director of the BR in his Report to WRC-15, there have been numerous non-GSO systems filed at the ITU in the past decade, and the possible speculative nature of such submissions could lead to spectrum warehousing and resurgence of so-called "paper" satellite systems. The problem has only increased since WRC-15, therefore WRC-19 should adopt a new regime to be applied expeditiously.

OneWeb agrees with Ofcom that the new process should be sufficiently flexible to accommodate existing and planned networks and encourage efficient use of scarce spectrum and orbital resources. In this regard, a balance needs to be sought between the need to prevent warehousing of the orbital/spectrum resource, the operational requirements related to the development and deployment of a non-GSO satellite system and the required certainty to allow the proper functioning of coordination mechanisms.

BIU

The bringing into use of frequency assignments to non-GSO systems should continue to be achieved by the deployment of one satellite into one of the notified orbital planes within seven years of the date of receipt of the API or request for coordination, as applicable. This seven-year period provides ample time for the securing of financing, the engineering design of the system, and the manufacture and launch of at least one satellite. OneWeb believes that the operational period of 90 days for a non-GSO satellite to be declared as successfully being brought-into-use is reasonable and would prevent gaming possibilities, such as the BIU of multiple filings with a single satellite. On the other hand, such a minimum period is not as essential for non-GSO satellites as they are for GSO, since it is quite difficult to change the orbital parameters of a non-GSO satellite, especially as it pertains to orbit inclination. Whilst in theory, if there is no minimum operational period on the intended orbit, a single satellite could be used to BIU multiple non-GSO satellite filings with the same inclination angle, but different altitudes, the adoption of a minimum period does not completely alleviate the problem, since the satellite could remain at each desired altitude for the required 90-day period before continuing its journey to another altitude. This possibility, compounded by the fact that a single satellite can also BIU a complete non-GSO filing comprised of multiple orbits (altitudes, inclinations), makes this aspect not that useful to deter paper filings.

Milestone-based Regime

In addition, a milestone-based regime should be established to provide additional time beyond the seven-year regulatory period for the deployment of the number of satellites, as notified and/or recorded. This

regime should be inclusive of a BIU factor, to be applied if a milestone is missed. It important to distinguish this milestone period, which would be allocated for the launch and deployment of fully designed satellites, from the original seven-year regulatory period, which is allocated for the design of said satellites. The milestone period should not be exploited for the design of new technologies, as this would encourage operators to launch incomplete or simplified satellites at time of BIU, thus lending to further uncertainty and speculation.

OneWeb believes that the first milestone should be no later than 2 years after the end of the 7-year regulatory period and should require a low % of deployment, such as 10%. A requirement to deploy 10% of the constellation 9 years after the submission of the system’s AP4 information should not pose a significant burden on systems filed with an actual plan to deploy and provide services to consumers. Instead, it would establish an early milestone that prevents spectrum warehousing by “paper systems” that might have found a low-cost way to BIU, but that have no real plans to fully deploy an operational system. An intermediate milestone should be established as a checkpoint midway throughout the deployment of the system, to encourage a reasonable rate of deployment, again to avoid that with a few satellites, an operator can protect its filing for many years with no further deployments. Finally, a third milestone should be established with the requirement to reach a full or close to full deployment of the constellation. The timing of this milestone should allow enough time to fully deploy the constellation, without creating unnecessarily long periods of uncertainty around non-GSO systems.

OneWeb is of the view that approaches that have a limited number of milestones or a delayed first milestone will extend the period of uncertainty around frequency assignments in the MIFR and will cater to warehousing.

The milestone-based methodology should apply to non-GSO systems operating in the following bands and services. Other bands could also be considered.

Bands (GHz)	Space Radiocommunication services
10.7-11.45	FSS
11.45-11.7	FSS
11.7-12.75	FSS
12.75-13.25	FSS
13.75-14.5	FSS
17.7 -19.7	FSS
19.7-20.2	FSS and MSS
27.5-29.5	FSS
29.5-30	FSS and MSS
37.5-39.5	FSS
39.5-40.5	FSS and MSS
40.5-42.5	FSS and BSS
47.2-50.2	FSS
50.4-51.4	FSS
71-74	FSS and MSS

74-76	FSS
81-84	FSS and MSS
84-86	FSS

Other services not listed above but operating on a co-primary basis with the FSS in the above bands would also be subject to the milestone-based approach.

Transitional Measures

Transitional measures will be required to ensure that all non-GSO systems, including those brought into use before the date of entry into force (EiF) of the new milestone regime, are not unduly burdened by the milestones. Systems with a 7-year regulatory deadline after the EiF of the milestone-based methodology should not be subject to transitional measures.

OneWeb is of the view that the only provision required for systems with a 7-year regulatory deadline expiring before the date of EiF of the milestone-based regime is to set the reference date for the milestones of these few systems to the date of EiF. We believe that the date of EiF of the milestone-based methodology should be the first day after the end of WRC-19 (i.e. 23rd November 2019).

Taking into account that the first milestone will require a low percentage of deployment and that it would only happen 1 to 4 years after the date of EiF (according to the Options contained in the draft CPM text on Issue A), and so 8 to 11 years after the AP4 information submission, we see no need to further delay the entry into force of the solution to a problem that was already identified before WRC-15. Such a delay would be a superfluous and unwarranted extension of time that would only serve to prolong uncertainty.

It is worth noting that this transitional measure would already provide additional time to reach specific deployment milestones to systems with a RR No. 11.44 period expiring before WRC-19. For instance, considering the current UK proposal for the milestones, a system with a regulatory deadline 1 year before WRC-19 would be allotted 10 years to reach 10% of deployment, while a system with a No. 11.44 period expiring on the day after the end of WRC-19 would be given 9 years to reach 10% of deployment. That is, in both cases the specific date to reach 10% would be 23rd November 2021.

In addition, setting the reference date for the milestones of these systems to the date of EiF of the milestone-based regime is a simple solution that would avoid unnecessarily overcomplicated solutions, such as those proposing different sets of milestones for systems with a regulatory date just before WRC-19 versus those immediately after. Such exceptional transitional measures often lead to cliff-edge situations between the deployment obligations of systems, simply because their 7-year expiry date is arbitrarily before or after a specific date.

Question 11: *What are your views on Agenda Item 9.1.1?*

OneWeb has no view on this item.

Question 12: *What are your views on the potential establishment of satellite pfd limits, in the 1 452 – 1 492 MHz band, to protect terrestrial use?*

OneWeb has no view on this item.

Question 13: *Do you have any views on the bands being studied and are there any other considerations which you think should be taken into account? What are your views on the appropriateness of the current emission limits in the band 3 700 – 4 200 MHz?*

OneWeb has no view on this item.

Question 14: *Do you agree that no changes to the RRs are required, under Agenda Item 9.1.7, and that managing the unauthorised operation of earth station terminals (deployed within its territory) should be addressed by the national administration concerned?*

OneWeb believes that this is a National matter and that no changes are required to RR.

Question 15: *What are your views on the need for additional fixed satellite service allocations in the band 51.4 – 52.4 GHz?*

OneWeb believes that the additional allocations have merit, but is not so interested as it would not increase the amount of spectrum for non-GSO FSS systems.

Question 16: *What are your views on Agenda Item 1.8, particularly the need to enhance maritime safety, set against the need to respect the international spectrum allocations and the protection of passive services in adjacent bands?*

OneWeb has no view on this item.

Question 17: *What are your views on Agenda Item 1.9.1, particularly the need to respect the current integrity of the AIS?*

OneWeb has no view on this item.

Question 18: *What are your views on Agenda Item 1.9.2, particularly the need to take into account current national users in the bands defined by RR Appendix 18?*

OneWeb has no view on this item.

Question 19: *What are your views on Agenda Item 1.10 and do you think that any changes to the Radio Regulations may be necessary?*

OneWeb has no view on this item.

Question 20: *What are your views on Agenda Item 1.11, and do you agree that no specific identification for rail communications is required in the Radio Regulations?*

OneWeb believes that such applications can be adequately served within existing mobile service allocations, including IMT bands. There is no need for additional regulatory provisions in the RR.

Question 21: *What are your views on Agenda Item 1.12 and do you agree that there is no requirement for specific identification to ITS in the Radio Regulations?*

OneWeb believes that such applications can be adequately served within existing mobile service allocations, including IMT bands. There is no need for additional regulatory provisions in the RR.

Question 22: *What are your views on Agenda Item 9.1.4 concerning radiocommunications for sub-orbital vehicles?*

OneWeb has no view on this item.

Question 23: *What are your views on Agenda Item 1.1, recognising that licensed amateur operators in the UK already have access to parts of the 50 – 54 MHz band?*

OneWeb has no view on this item.

Question 24: *What are your views on Agenda Item 1.2 concerning power limits for MetSat, Mobile Satellite and EESS, and the linkage to agenda item 1.7?*

OneWeb has no view on this item.

Question 25: *What are your views on Agenda Item 1.3, particularly on any limits required to protect terrestrial use?*

OneWeb has no view on this item.

Question 26: *What are your views on Agenda Item 1.7 considering spectrum needs for short duration satellites, noting also the potential linkages to Agenda Item 1.2?*

OneWeb believes that there could be merit for regulatory provisions that are specific to short duration mission satellites, but these should not apply in bands where large non-GSO FSS constellations are planned such as the Ku-band, Ka-band and Q/V-bands. Such procedures may be applicable in certain Amateur-satellite or scientific bands, that are not shared with the FSS. Otherwise, service providers that rely on low-cost nanosatellites should not be permitted to bypass the Articles 9 and 11 coordination, notification and registration processes if they have the potential to interfere or suffer interference from non-GSO FSS systems that adhere to the current regulatory provisions.

Question 27: *What are your views on Agenda Item 1.15, particularly on the protection needs of passive services?*

OneWeb has no view on this item.

Question 28: *What are your views on Agenda Item 9.1.6, particularly on the categorisation of WPT and whether WRC action is required?*

OneWeb has no view on this item.

Question 29: *Do you have any comments concerning the Standing Agenda Items, where not covered elsewhere in this document?*

OneWeb has no view on this item.

Question 30: *Are you aware of any specific issues, not covered elsewhere in this document, which are likely to be raised in this part of the Director's Report and of which you think Ofcom should be aware?*

OneWeb is not aware of issues that may be brought up by the Director in his report to the WRC-19, but if history is a guide, this report will likely bring new issues that no one has yet considered, and which will need study within the UK and CEPT preparatory processes.

Question 31: *Do you have any comments on Agenda Item 9.3 considering Resolution 80?*

OneWeb has no view on this item.

Question 32: *What changes to the Radio Regulations have you identified that would benefit from action at a WRC and why? Do you have any proposals regarding UK positions for future WRC agenda items or suggestions for other agenda items, needing changes to the Radio Regulations, that you would wish to see addressed by a future WRC?*

The ITU-R studies under Agenda Item 1.6 have demonstrated that basing the coexistence between GSO and non-GSO systems in efd limits results in spectrum inefficiencies and unduly restricts the design and operation of non-GSO systems. Should WRC-19 adopt a solution based on limiting the increase in unavailability of GSO links caused by the operation of non-GSO systems as a protection or sharing solution between GSO and non-GSO in the Q/V-bands, it would only be natural to explore the application of this new sharing framework to other frequency bands, such Ka.

OneWeb would support a future Agenda Item to address this topic, but not necessarily for WRC-23, given that it might be useful to gain experience with the implementation of this solution in the Q/V-bands first.