Your response

Question	Your response
Question 1: Do you agree with the prioritisation of the agenda items, as shown in Annex 5, and if not why?	Confidential? – N OneWeb proposes some changes to Ofcom's prioritisation of the agenda items. Firstly, OneWeb proposes to change the UK priority of 1.17 to HIGH. There is concern with the uplink situations between NGSO LEO user satellites communicating with other LEO, MEO, or GEO satellites in the Ka band causing high levels of interference to the OneWeb constellation. Additionally, OneWeb would like to raise the priority of 1.15 to HIGH. It is important to ensure that limits are adopted to ensure the protection for incumbent non-GSO systems from the impact of both maritime and aeronautical ESIM systems. OneWeb would also like to change the UK priority of agenda item 7 to HIGH. Among all the topics this item contains, there are several specifically that are important to the OneWeb system. These are topics A, B, D2, D3, and J that may have system impacts to OneWeb. The reasons are explained in depth under that agenda item. OneWeb proposes to increase the level of priority of Issue 9.1.c to HIGH. The reason for that is because the possible introduction of 5G IMT into the Ku band currently allocated to NGSO FSS and also in many frequency bands to the fixed service. This is a significant threat to any NGSO utilising this band due to the likelihood of interference. The next item that OneWeb would like to increase the priority is agenda item 10, where the agenda for the WRC-27 will be proposed. It is a great opportunity to support some preliminary items as well as propose new agenda items. OneWeb addresses this in more detail under the respective agenda item of this document. Finally, OneWeb will like to set as HIGH issues related to No. 21.5, where limiting the power for active antennas is something crucial to limit the

	aggregate interference caused from terrestrial systems employing advanced antenna arrays into receiving satellite systems. The limits should apply to the aggregate power for all the elements of the antenna system.
Question 2: What are your views on the continued need to protect global aeronautical and maritime services, in the 4.8 – 4.99 GHz band, under this agenda item?	Confidential? – N OneWeb expresses no view on this question.
Question 3a: Do you agree that the UK interest in the bands 3 600-3 800 MHz and 3 300-3 400 MHz in Region 2 (North & South Americas) should be limited to any impacts on UK operational use in those areas?	Confidential? – N OneWeb expresses no view on this question.
Question 3b: Do you agree that the UK should maintain its objections to changes to the regulatory environment for the band 3300-3400 MHz (in Region 1, Europe, Africa, Middle East), noting UK has interests in use of radar for both ground and airborne operations?	Confidential? – N OneWeb expresses no view on this question.
Question 3c: What is your view on the use of 6425-7025 & 7025-7125 MHz, and what evidence do you have to support this view? How does that inform your views on a IMT identification in these bands?	Confidential? – N OneWeb expresses no view on this question.
Question 3d: What are your thoughts on the current UK view that IMT should not be identified in Region 2 in the band 10-10.5 GHz in order to ensure the protection of the globally operating EESS (active) systems and airborne & vessel mounted radars?	Confidential? – N OneWeb expresses no view on this question.
Question 4: Do you agree that, where no additional technical limitations are placed on mobile services, the UK can support an upgrading of the mobile allocation, in 3600 - 3800 MHz, from secondary to primary?	Confidential? – N OneWeb expresses no view on this question.

Question 5: What are your views on the development of regulatory conditions to facilitate deployment of high altitude IMT base stations in IMT identified bands below 2.7 GHz?	Confidential? – N OneWeb expresses no view on this question.
Question 6: Do you agree that a formal modification to the Radio Regulations is not needed for fixed service applications that use IMT technologies?	Confidential? – N OneWeb agrees that there should not be a modification to the Radio Regulations for fixed service applications that use IMT technologies. OneWeb would like to oppose any introduction of mobile service or 5G in Ku, Ka or V band as those are reserved for Satellite Services. Providing IMT technologies access to these bands will overlap with satellite allocations provided in Article 5 of the Radio Regulations. As mentioned in the text "it might infer a technology limitation in those bands as well as implying that those are the only fixed service bands that could be used by IMT technologies" and these bands (Ka, Ku and V band) are currently being used in the FSS, either Earth-to-space or space-to-Earth.
Question 7: What are you views on the proposed approach for 470-694 MHz, recognising the national decisions already in place and taken for DTT multiplex licensing in the band, and the additional and supplementary spectrum made available for UK PMSE usage?	Confidential? – N OneWeb expresses no view on this question.
Question 8: What are your views on the need to establish an international regulatory environment that provides adequate protection of UK fixed links from earth stations in motion, in the band 12.75 – 13.25 GHz, which is also practicable from an enforcement/implementation perspective?	Confidential? – Y / N OneWeb agrees with Ofcom that there is a need for an international regulatory environment to provide adequate protection of UK fixed links from earth stations in motion. OneWeb also agrees on being concerned over the question that if the protection limit set on in the Decision 19(04) will be sufficient protection to the NGSO as the PFD in the Decision is only with respect to the GSO ESIMs. Proposed EIRP density limitations with detailed supporting technical studies have been included under the WP4A OneWeb document (4A/847) [1]). These studies were used to develop a compromise solution at the September Working Party 4A meeting in the

	draft CPM text for EIRP density limits to enable GSO ESIMs operations while providing protection to NGSO satellite reception.
Question 9: Do you agree that the UK continues to support the maritime distance figure for ESIMs that work to non-geostationary satellites and to test the other conditions agreed at WRC-19 for ESIMs working to geostationary satellites to ascertain whether these remain appropriate for non-geostationary satellites?	OneWeb recommends that in addition to protecting terrestrial systems, that Ofcom address measures to ensure protection of NGSO FSS systems (on-axis and off-axis EIRP density limitations).
Question 10: What are your views on whether an allocation to inter satellite links is necessary for existing satellite allocated bands and whether this would provide benefits internationally?	Confidential? –N OneWeb supports having Inter Satellite Links (ISLs) well regulated at the ITU level. Studies were carried out for the within the cone scenario, in the Ka band 27.5 – 30 GHz and for NGSO LEO user stations communicating to LEO service providers (4A/848)[2] and it concluded that proposed EIRP density of (-20 dBW/Hz) will lead to harmful interference to victim non-GSO FSS receive stations, such as causing loss of the RF link, loss of synchronization and even to the extent of hardware damage. An EIRP density of no more than -30 dBW/Hz should be considered for non-GSO-to-non-GSO links. Additionally, there is no need for higher power values due to the short distances between possible non-GSO users and non-GSO service providers. This shows the importance of carefully regulating ISLs internationally and developing appropriate protections that still address the needs of the user community. Again, this study was only carried out using one certain case. If the case is NGSO LEO user station to MEO service provider or NGSO LEO user station to GEO service provider this will also have to be regulated as the EIRP from the interference vehicle will be higher than the previous case (see, for example, the studies in 4A/621)[3] causing an even higher threat to the victim satellites in case of an in-line event. OneWeb continues to work with the international community to arrive at a solution to protect its satellites during inline events. One solution is to include a maximum altitude limitation of 900 km for any NGSO user stations. The draft CPM text at the September WP 4A

	meeting noted that the expected user altitudes range from 300 km-900 km. This would be a workable solution as the scientific missions or other smaller satellites envisioned to use these intersatellite links would operate below this level of 900 km. Such an approach would not address interference to NGSO victim satellites operating at lower altitudes. Another potential solution would be operationally sharing ephemeris data to enable NGSO user stations not to transmit when within a cone around an operational NGSO victim satellite. OneWeb requests that Ofcom support finding a solution to protecting NGSO victim satellites from harmful interference.
Question 11: What are your views on the need for additional satellite allocations in support of narrowband IoT "M2M" type applications, noting that there remains the continued use of PMSE for wireless cameras in the band 2010 – 2025 MHz?	Confidential? – N OneWeb expresses no view on this question.
Question 12: What are your views on the proposed approach to this agenda item concerning the fixed satellite service in 17.3-17.7 GHz in Region 2?	Confidential? – N World Vu supports the approach taken in the draft CPM text in WP 4A on this topic.
Question 13a: On Topic B, what are your views on the post milestone procedures for non-geostationary satellite systems?	Confidential? –N While OneWeb can see the need in the future for a post milestone procedure, OneWeb recommends that experience be gained first with application of the Resolution 35 milestone procedure before adoption of post milestone procedures. The first milestone for the first NGSO systems subject to the Resolution 35 regime occurs in January 2023, with the second milestone occurring in 2026 and the third milestone in 2028 (see *resolves* 8 of Resolution 35). As a result, OneWeb recommends waiting until WRC-27 to take on this issue once greater experience is gained with Resolution 35.
Question 13b: On Topic L, what are your views on regulatory conditions for Telemetry, Tracking and Command (TT&C) for NGSO in-orbit servicing?	Confidential? – N OneWeb is generally supportive of the need to provide for NGSO in-orbit servicing, as an important alternative to address satellites that

	may contribute to orbital debris when other solutions are not available. However, OneWeb recognizes and respects that concerns have arisen with respect to use of agenda item 7 to address issues that may be considered allocation matters.
Question 13c: What are your views on the remaining topics currently listed for Agenda Item 7?	Confidential? – Y / N OneWeb does have some topics under agenda item 7 that it would like to comment on: Regarding **topic A** the tolerances for NGSO orbital characteristics, OneWeb supports efforts to define tolerances for the four orbital characteristics identifying a "notified orbital plane" and believes that the ultimate tolerances defined need to provide adequate flexibility for NGSO systems to deploy as planned. For example, OneWeb maintains a separation of several kilometers between each of its planes to avoid the possibility of collisions between its own satellites. Further, providing adequate flexibility would enable NGSO operators to accommodate new systems without having a negative impact on the status of their ITU filing. OneWeb also recommends a different percentage for each of the characteristics based on the orbit altitude. This is because the same percentage for all orbits will cause a huge difference between a 10% of GSO from a 10% of LEO. For **topic J**, OneWeb believes that a critical first step to addressing this issue is finalizing a Recommendation on the accurate determination of the aggregate epfd produced by multiple co-frequency operation NGSO systems. OneWebShould any consultation procedures be adopted at WRC-23, it is important that only operational systems with a sufficient number of operational satellites be taken into account in the aggregate epfd calculations and in addressing any epfd exceedances. **Topic D2**. OneWeb supports the improvement of Recommendation S.1503 to accurately model NGSO systems while ensuring the Article 22 epfd limits are met to protect GSO systems. The current version (S.1503-3) does not adequately model interference from NGSO systems and leads to design constraints on NGSO systems. OneWeb supports the completion of S.1503-4 to

	ensure efficient use of spectrum. Issue D2 will allow the associated necessary updates to the Appendix 4 data items at WRC-23 to gather the necessary information for the foreseen updates to S.1503. **Topic D3**. OneWeb supports additional reminders from the BR to support administrations in maintaining their ITU filings. Under this Topic, BR reminders would be sent with respect to the need to confirm the bringing into use or bringing back into use of satellite networks.
Question 14: Noting that any UK position will be developed only after the ITU Plenipotentiary Conference, do you have any comments relating to the use of Article 48 that may be addressed at WRC-23?	Confidential? – N OneWeb expresses no view on this question.
Question 15: What are your views on the need to establish an international regulatory environment for sub-orbital vehicles, which at the same time does not limit flexibility of spectrum options, and retains international safety considerations?	Confidential? – N OneWeb expresses no view on this question.
Question 16: Do agree that where the adjacent band compatibility issues are addressed and ICAO coordination processes are not compromised, that the addition of an aeronautical satellite (AMS(R)S) allocation to the band can be supported?	Confidential? – N OneWeb expresses no view on this question.
Question 17: Do agree that functions related to international aviation safety are a matter for ICAO? On this basis, and absent any contrary information from ICAO, should the UK support the development of an international spectrum regulatory framework for UA use of FSS that would support efficient use of spectrum?	Confidential? – N OneWeb expresses no view on this question.

Question 18: Recognising the recent diminishing industry interest in this item relating to possible modification of the aeronautical HF assignment plan, and the general lack of global interest, do you agree	Confidential? – N OneWeb expresses no view on this question.
that UK move towards a No Change proposal under this agenda item?	
Question 19: What are your views on the need for additional spectrum, specifically in the 15 and 22 GHz bands, for non-safety aeronautical use?	Confidential? – N OneWeb notes that sharing difficulties could arise in bands shared with the fixed-satellite service (e.g., 17.3-21.2 GHz).
Question 20: What are your views on Agenda Item 1.11 and the proposed UK position to support modernisation of GMDSS?	Confidential? – N OneWeb expresses no view on this question.
Question 21: What are your views on the approach to the review of 1240-1300 MHz, recognising that discussions concerning future satellite navigational needs for the UK are a matter for Government?	Confidential? – N OneWeb expresses no view on this question.
Question 22: What are your views on a new spectrum allocation in the 40-50 MHz range to support and enhance climate monitoring, such as, environmental shifts in ice sheets?	Confidential? – N OneWeb expresses no view on this question.
Question 23: What are your views on upgrading the Space Research Service allocation, from secondary to primary, in the 14.8-15.35 GHz band?	Confidential? – N OneWeb expresses no view on this question.
Question 24: What are your views on the potential for defragmentation in this band to facilitate both EESS (passive) use and provide for larger contiguous blocks for fixed & mobile allocations?	Confidential? – N OneWeb expresses no view on this question.
Question 25: Do you agree that formal international recognition for Space Weather Sensors should be implemented in the Radio Regulations?	Confidential? – N OneWeb expresses no view on this question.

1. **4A/847.** [Online] https://www.itu.int/md/R19-WP4A-C-0847/en.
2. **4A/848.** [Online] https://www.itu.int/md/R19-WP4A-C-0848/en.
3. **4A/623.** [Online] https://www.itu.int/md/R19-WP4A-C-0621/en.

Question 26: What are your views on the limits proposed to protect EESS (passive) under Agenda Item 9.1 topic d) and do you have any views on which of these limits might be accommodated in the Radio Regulations and how?	Confidential? – N OneWeb notes that it plans to use the 37.5-42 GHz band for downlinks from satellites to gateway earth stations for it second generation satellites.
Question 27: Do you agree that the formalised time reference in common global use, is not a matter of spectrum regulation?	Confidential? – N OneWeb expresses no view on this question.
Question 28: Do you have any comments concerning the Standing Agenda Items, where not covered elsewhere in this document?	Confidential? – N No.
Question 29: Do you have a view on any of the footnotes to which UK is a party?	Confidential? – N OneWeb expresses no view on this question.
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?	Confidential? – .N No.
Question 31: Do you have any comments on Agenda Item 9.3 considering Resolution 80?	Confidential? – N No.

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?	Confidential? – N OneWeb would like to make additional proposals for WRC-27, agenda item 10. OneWeb supports the preliminary Agenda Items: - Agenda Item 2.2. Regulatory measures for ESIMs in V band communicating with GSO - Agenda item 2.7. Use of NGSO feeder links in 71-76 GHz and 81 – 86 GHz in accordance to Res 178. OneWeb would like to propose a new Agenda Item: - Consider an allocation for NGSO FSS gateways in 51.4-52.4 GHz

Question 33: What are your views on the use of IMT stations that use antennas that consists of an array of active elements, in bands shared with satellite services?	Confidential? – N OneWeb notes that IMT stations can use antennas consisting of an array of active elements. However, OneWeb would like to express the opinions on the 3 issues raised by CEPT in relation to No. 21.5. **Issue A:** OneWeb agrees with the position taken. Satellite services should be protected before deploying IMT stations or other Fixed and Mobile services. In case the power limit if RR No. 21.5 is applied to each transmitter or radiated element, then it will allow an IMT base to transmit power 30 dB higher than intended. This will exceed the satellite protection criteria. Hence, it should not be allowed. **Issue B:** OneWeb agrees as well and believes that the limit imposed by No. 21.5 should be applied to the aggregation of all elements and extensions to all relevant uplink bands (Issue A) **Issue C:** OneWeb notes that there is a need to update Table 21-2 to include frequency bands, where reception by space stations is to be protected when these frequency bands are shared with equal rights with the fixed or mobile services (including for IMT stations), and not yet included in Table 21-2. The following frequency bands should be added to Table 21-2: ▪ FSS allocations in 24.65-25.25 GHz (Region 1), 24.75-25.25 GHz (Region 2), 42.5-43.5 GHz, 47.2-50.2 GHz, 50.4-51.4 GHz and 81-86 GHz. ▪ MSS allocations in 43.5-47 GHz, 66-71 GHz, and 81-84 GHz.

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