Your response

Question	Your response
Question 1: Do you have any comments on the coexistence analysis we have carried out?	Confidential? – N This 'call for inputs' (CFI) presents a coexistence analysis in support of the case for making more spectrum in the 1.4 GHz band available for mobile services, which is understood to mean terrestrial mobile services using IMT technology. However, this intention could be considered as being overtaken by recent developments at the ITU, where Agenda Item 1.13 for WRC-27 is set to consider studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and IMT user equipment to complement terrestrial IMT network coverage. This is important to consider since our conclusion here on the coexistence analysis is that the measures proposed would not prevent considerable damage to the viability of satellite communication services for land, sea and aeronautical applications in the adjacent frequency bands above 1518 MHz. In contrast, the use of the band 1492-1518 MHz for satellite downlinks into IMT user equipment would be much more conducive to achieving coexistence and making optimum use of the frequency resources around 1.4 and 1.5 GHz. Our understanding is that the intention of the coexistence analysis is to create zones, within which the PFD from IMT base stations would be limited to values that are estimated to avoid loss of sensitivity (blocking) in the reception of satellite service downlinks in the range 1518-1559 MHz. However well this might be managed, it remains the case that blocking is not the only threat to the operation of MSS services. Unless otherwise stated MSS refers to mobile satellite services operating I the band 1518-1559 MHz. Significant unwanted emissions from IMT base stations risk sterilizing a swathe of spectrum above 1518 MHz – a circumstance that has received less attention in the ECC report analysis, even though such loss of spectrum would reduce the capabilities and viability of the present satellite service providers, as well as limiting

	access to spectrum for new entrants providing general mobile satellite communications and with the capability to provide specialized satellite communication services to the maritime sectors. MCA is particularly concerned that the introduction of terrestrial IMT services will degrade the provision of recognized mobile satellite services (RMSS) in the Global Maritime Distress and Safety System (GMDSS) by the current providers, create barriers on new providers, and frustrate competition. It should be noted that both the current RMSS providers, Inmarsat and Iridium, have built their supporting MSS services over land, sea and air as founding signatories to the Memorandum of Understanding on Global Mobile Personal Communications (GMPCS) initiated in 1997 under the auspices of the ITU which the UK adhered to for the protection of the satellite service spectrum. As will be elaborated in subsequent responses, the two main concerns with the present proposals are that the coexistence analysis: 1) concentrates on expecting changes to the long-established satellite terminal equipment performance standards, ostensibly to reduce blocking effects on terminals, though without assessing the timing, feasibility and costs associated with such changes, the implications of diverging from internationally harmonized standards for terminals covered by internationally mandated carriage requirements on ships; 2) fails to elaborate to a useful extent on the other interference mechanism widely acknowledged to characterize IMT equipment, namely that of significant spurious and out-of-band emissions into adjacent bands, that could completely preclude (see Note 1 to Table A1-1 of draft new Recommendation ITU-R M.[REC.MSS & IMT L-BAND COMPATIBILITY]) the use of the extension band 1518-1525 MHz for satellite communications. That extension band was promoted by UK and Europe at WRC-03, as being necessary to obviate congestion and provided the widest possible penetration of advanced multi-functional mobile satellite communication services – services that now support the

	provision both of essential and cost-free safety communications for seafarers).
Question 2: Do you have any comments on the proposed sizes and implementation methods for the PFD limited and coordination zones, both individually and as hybrid options?	[✂CONFIDENTIAL]
Question 3: Do you consider that PDF limited/coordination zones defined using complex polygons would make deployment of this spectrum for mobile more complex than zones which are defined by simple shapes?	Confidential? – N As per the Q2 response above covers, there seems to be no need to over-complicate the exercise – IMT coverage is well maintained over UHF and L-band frequencies, but this does not obviate concerns about extensive terminal blocking and significant spurious and out-of-band emissions degrading MSS use above 1518 MHz.
Question 4: Do you have any other suggestions for how we might make the 1492-1517 MHz block available for mobile while protecting satellite use of the adjacent band?	Confidential? – N Considering that the known risks to various radiocommunication services in adjacent bands have been well described during the preparations for WRC-12 and WRC-15, it is a matter of concern that the present proposals for the use of the band 1492-1518 MHz gained traction. The threat to MSS services in the bands above 1518 MHz are twofold: 1) The blocking of MSS terminals from terrestrial IMT base stations; 2) Excessive spurious and out-of-band emissions from IMT equipment that can sterilize a swathe of spectrum above 1518 MHz, which is in-band for MSS terminals and could not be alleviated by any measures aimed at improving the blocking immunity of MSS terminals. Both interference mechanisms would degrade the usefulness of MSS spectrum above 1518 MHz and thus compromise the commercial operations of the MSS operators. In this connection it is imperative to note that that maintaining the commercial viability of MSS operators is essential to MSS operators, current

	and future, providing essential communication infrastructure for maritime and aeronautical communications and for supporting those services provided free of charge for the safety of seafarers and navigation. Moreover, it is necessary to recall the reasons for extending portion of L-band dedicated to downlinks below 1559 MHz down to 1518 MHz, which were well supported throughout Europe, with UK at the forefront, and other regions of the world (e,g, the Asia/Pacific Telecommunity, namely: ● The 1.5/1.6 GHz band MSS allocations are heavily used, leaving little scope for further expansion in these bands. The experience during a Region 1 and 3 Review Meeting of 1.5/1.6 GHz band Operators prior to WRC-03 confirmed that the 1.5/1.6 GHz band MSS spectrum was congested. This was further supported during ITU-R preparations for WRC-03, which showed that an additional 2 × 8 MHz was needed just to satisfy the spectrum requirements foreseen up to 2005 alone. ● The UK position for WRC-03 matched that of CEPT, particularly in respect of support for additional MSS allocations in the bands 1518-1525 MHz (space-to-Earth) and 1668-1675 MHz (Earth-to-space), along with worldwide harmonization of the proposed new band. Following the satisfactory outcome in securing the extension 1518-1525 extension band at WRC-03 the EU Commission Report on WRC-03 (COM(2003) 707 final) noted that "*After several inconclusive discussions in previous Conferences, WRC-03 was able to identify an additional 2 x 7 MHz for MSS*". , and further noting that, "*The European Union supported at WRC-03 the enhanced provision of spectrum for Mobile Satellite Service systems, as an alternative means to supply mobile communication services to customers, on the basis of* ***realistic market projections***" Since WRC-03, MSS operators have made full use of the band extension, introducing many technological advances, e.g., digital technology and use of dynamically assigned spot beams, in order to optimize spectrum use of the additional spectrum resources. Inmarsat has made full use of the band extension in new satellite

	deployments from then on with the Broadband Global Area Network (BGAN). In addition to commercial applications in mobile communications BGAN has proved especially useful for emergency communications following natural and man-made disasters. The loss of spectrum above 1518 MHz on account of terminal blocking and significant spurious and out-of-band emissions would therefore compromise the viability of 1.5/1.6 GHz MSS services in and to the detriment of user demand and commercial imperatives. Lack of spectrum for L-band MSS services has been a long-standing problem and sterilisation of the existing resources would create severe problems for Inmarsat and other MSS operators. Because of contention in the 1.5 GHz portion of L-Band spectrum is shared between operators under the GMPCS MoU, meaning that any loss of spectrum access will, at the least, freeze MSS services and coverage in time. In particular, loss of spectrum access would threaten the reliability of existing Inmarsat services and constrain the further development of Internet Protocol based broadband communications using dynamically assigned spectrum and coverage solutions. A dependable environment is essential to preserving the integrity of the safety related services provided by Inmarsat and the settled expectations of users in the maritime sector. Overall, loss of spectrum access in the 1.5 GHz bands would lead to reduced competition in the provision of electronic communication services. As such, serious consideration should be given to alternative uses of the 1492-1518 MHz band. A simple solution, with hindsight, would have been to avoid these present concerns and promote a further extension of the MSS band for consideration at a WRC in order to expand satellite communications for all mobile applications , including those to support the GMDSS. That is now a lost opportunity, but assuming that there is a genuine need for yet more resources for IMT, the use for satellite delivery of IMT connectivity in the 1492-1518 MHz band should be considered under the newly adopted agenda item 1.13 for WRC-27, since compatibility between two space-to-earth

	services in adjacent bands may be more achievable than that between a heavyweight terrestrial service and a sensitive satellite downlink.
Question 5: What are your views on the timescales for relaxing the PFD limits and coordination restrictions?	Confidential? – N We believe an assumption of 5 -7 year period is too short if it is to be aligned with the availability and expected take-up of equipment with improved blocking performance. Any relaxation of the limits and restrictions should only occur when the implications of interference and overloading for the seafarer are mitigated by taking into account the performance of the radio installations on board. The sea is a global highway and the vessels off the UK coast or visiting the UK comply with the safety and safety requirements of their flag-state; there are some 200 flag-states. We would expect a period of 15-20 years to be more realistic, but we are unable to make a definite statement. The International Mobile Satellite Organisation (IMSO), in ECC (19)INFO 01, identified some of the implications of interference and overloading of maritime satellite communication terminals as: *1 seafarers may not be able to test the operation of satellite safety equipment during a Port State Control inspection or prior to departure from port, and it may not be possible to carry out maintenance or mandatory surveys as required;* *2 vessels may be non-compliant with their regulatory obligations (e.g., LRIT and SSAS) and therefore may not be able to operate;* *3 seafarers may be unable to receive information (e.g. EGC which includes MSI (Maritime Safety Information)), making route planning difficult and posing a risk to maritime safety; and* *4 seafarers may use applications that require reliable communications over all coastal areas and along connecting rivers and waterways to marine facilities, including all types of ports, harbours, marinas, berthing areas,*

	which may be situated some way from the coast and will usually be near centres of population. A number of factors affect the timeline for installations with improved blocking performance. The radio installations for vessels operating under the International Maritime Organisation (IMO) conventions and codes have to be in accordance with the performance standards of the IMO. The IMO has developed a performance standard for Inmarsat-C GMDSS ship installations with improved blocking performance but without an obligation to replace equipment in existing installations except when it fails and is unmaintainable. The standard applies from 1/1/2028 although fitting of new standard equipment is permissible. The installed equipment shall be type approved by the flag-state of a ship. The same requirements are mandated on vessels of the UK and by other flag-states outside the scope of IMO agreements. For type approval, the International Electrotechnical Commission (IEC) develop test standards for the IMO performance standard. These tend to be favoured by the market as they are commonly adopted by flag-states for type approval. The IEC plans to publish the Inmarsat-C Ship Earth Station (SES) amended standard in March 2024. In the UK and EU countries, regulations additionally allow the use of equivalent ETSI standards instead, but this does not mean equipment is available on the market to such standards, nor that it may be fitted under regulation in all cases. Maritime equipment without national type approval can commonly be fitted to UK and Europe leisure vessels. For product availability, the time to market is ultimately determined by the manufacturers through their development cycles; their view of the market; and the need to obtain type approval. We expect product to the enhanced standard to be available before 1/1/2028 but have no other information. Manufacturers have indicated that IEC standards may be preferred because they are more widely accepted for type approval purposes giving a larger market.

	Installation of replacement equipment may depend upon the availability of authorised persons to replace SES equipment or certify such changes to installations as may be required by regulation. The vessel would not normally go to sea until the appropriate certification is in place. Any replacement is completed around a vessel's operational schedule. Life-expectancy of existing equipment is not known, but we understand that some currently installed Inmarsat-C SES are being maintained in excess of 15 years.
Question 6: Do you have any initial views on how the coordination we are proposing should be carried out? In particular, do you consider this should be conducted by Ofcom or the licensee?	Confidential? – N It is essential that coordination should be carried out by the responsible public body (Ofcom) given the potential adverse impact on the communication services provided by L-band satellite operators. It has to be understood that these are not limited to specific uses having a safety dimension but also include the commercial operations that support the provision of recognized mobile satellite services in the GMDSS, especially as the genesis of the GMDSS was founded on the expectation that the provision of communication over satellites was essential for ensuring that the reception and responses to emergencies at sea were not compromised by the technical and operational vagaries of terrestrial communications.
Question 7: Do you have any views on the potential impact of our proposed options, including impacts on specific groups of persons or more general impacts?	[✂CONFIDENTIAL]
Question 8: Do you consider an auction would be an appropriate way to make the upper 1.4 GHz spectrum available for mobile use? If not, what other methods do you think Ofcom should consider for making this spectrum available for mobile use?	Confidential? – N No comment

Question 9: If you consider an auction is appropriate, do you have any initial views on whether a single round auction or a multiple round auction would be more appropriate?	Confidential? – N No comment
Question 10: Do you have any views on the appropriate lot sizes for making this spectrum available?	Confidential? – N No comment
Question 11: Do you have any views on the potential impact on consumers, citizens and/or other stakeholders of auctioning the spectrum or the different auction formats?	Confidential? – N No comment

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