

RESPONSE FROM INMARSAT TO OFCOM CONSULTATION “SPECTRUM FRAMEWORK REVIEW”

1 Introduction

Inmarsat is pleased to provide comments to Ofcom on its Spectrum Framework Review.

Inmarsat is a UK based satellite operator, providing a global mobile satellite service to maritime, aeronautical and land based users. The current Inmarsat system operates in the L-band MSS spectrum (1626.5-1660.5 MHz and 1525.0-1559.0 MHz) and in C-band FSS spectrum. Inmarsat user terminals are capable of being used almost anywhere in the world. Maritime terminals are used to provide voice and data communications to ships. The Inmarsat network provides safety communications to ships as an integral part of the Global Maritime Distress and Safety System (GMDSS). Aeronautical terminals are used to provide communications to aircraft, for the purposes of air traffic management, operational communications for airlines, and communications for passengers. Land terminals are used to provide communications to users virtually anywhere in the world, particularly for those users who travel beyond the reach of terrestrial networks. Example users are journalists, government users, and globally travelling business men and women. An important application for Inmarsat terminals is the provision of emergency communications in disaster situations such as after an earthquake or hurricane.

Inmarsat is currently investing about \$1.5 bn in a new generation of satellites and new broadband services and terminals which, once two next generation satellites have been launched, will cover about 85% of the world's landmass. This important investment and deployment of innovative, advanced services for users relies on a predictable regulatory environment.

In the sections below we comment on the issues raised in the consultation document which are most relevant to Inmarsat: licence exempt spectrum, liberalisation in shared frequency bands, and harmonisation. We request that Ofcom takes account of our comments.

2 Licence exempt spectrum

In section 4.4, Ofcom discusses the longer-term availability of spectrum for licence exempt use. Although the discussion focuses on the use of terrestrial mobile systems for short range communications, the use of licence exempt spectrum for mobile satellite services should not be overlooked. Inmarsat's land mobile earth stations operate in licence exempt spectrum in the bands 1525-1559 MHz and 1626.5-1660.5 MHz. This spectrum and other allocations to the mobile satellite service are used by a number of MSS operators to offer services to UK citizens and visitors. A majority of countries in Europe also permit operation of Inmarsat and other mobile earth stations exempt from a licence. We are pleased that Ofcom recognises the need to retain spectrum for licence exempt operations and has a preference to “set aside spectrum for licence exempt use where possible” (section 4.6). We support this position, in accordance with the EU framework which promotes that *“the least onerous authorisation system possible should be used to allow the provision of electronic communications networks and services in order to stimulate the development of (...) pan-European communications networks and services and to allow service providers and consumers to benefit from the economies of scale of the single market”*.

Ofcom seeks input on the likelihood of congestion occurring in spectrum set aside for licence exempt use. Globally, the above frequency bands are in use by 9 GSO MSS operators. Many of the MSS systems have high rates of growth of customers and traffic and the congestion in these bands is becoming increasingly problematic. This is in spite of the significant investments and technical advances made by the mobile satellite industry over the past few years which have dramatically increased the efficiency of spectrum usage¹. There is widespread recognition throughout the world that these existing MSS bands are congested. It was in light of this problem that WRC-03 allocated additional spectrum to the mobile satellite service in bands in the vicinity of the existing L-band allocations. More recently, the ECC, with support from UK, has agreed a new Decision to designate the bands 1518-1525 MHz and 1670-1675 MHz to MSS - a total of 12 MHz.

The figures in section 4.2 of the consultation document suggest no increase in the licence exempt spectrum in the 1-3 GHz range. However we consider that these new bands should be considered as candidates for licence exempt operation of mobile earth stations in the UK. We believe that the need for these bands for MSS has been demonstrated already as part of the preparations for WRC-03 and Ofcom has already given its backing to the new allocations at WRC-03 and for the new ECC Decision ECC/DEC/(04)09. Spectrum for mobile satellite services is currently licence exempt and Ofcom should adopt the same approach to these “extension” bands.

In question 9, Ofcom asks “what is the appropriate timing and frequency bands for making available any additional spectrum for licence-exempt use that might be needed?” In the case of the additional MSS bands discussed above, Inmarsat’s plans for operation are currently under development. The soonest Inmarsat could commence operation in these bands would be about 2007.

In section 4.4.1, Ofcom indicates that it is considering removing the need for a licence for, among others, aeronautical and maritime equipment licences. Inmarsat’s ship earth stations and aircraft earth stations fall within the scope of this issue. Ofcom rightly points out that the International Telecommunications Union requires that crucial identification of aero and maritime terminals is possible. Inmarsat agrees, however, that it is feasible to achieve this aim without necessarily relying on a licence. We are keen to pursue - together with IMO - further discussion with Ofcom on the practical modalities.

3 Liberalisation in shared bands

The comments in this section are focussed on C-band spectrum shared between the fixed satellite service and terrestrial services.

The downlink FSS spectrum 3600-4200 is allocated in the UK to the fixed satellite service and the fixed service. The band 5725-7075 MHz is mostly allocated to fixed and mobile services in addition to the FSS for uplinks.

Most FSS operations are in the ranges 3600-4200 MHz and 5925-6700 MHz where the band is shared between FSS earth stations, point-to-point and point-to-multipoint fixed links. Inmarsat operates its feeder links in these frequency bands. Point-to-multipoint

¹ One of the main developments has been from use of “super-GEO” MSS satellites which allow for the use of a large number of small spot beams. This allows the same frequencies to be used many times simultaneously on the same satellite.

FWA systems are current limited to a small portion of the 3.6 GHz band so most inter-service sharing is between FSS earth stations and point-to-point fixed links.

FSS earth stations and point-to-point fixed stations have been able to co-exist in these bands through the practice of coordination between the two services. In fact, the use of these bands by these two services has led to the bands being used with much greater efficiency than would have been the case if the bands were used by only one service. However, Ofcom appears to only reluctantly acknowledge that some bands could remain shared when it states in section 4.7.3: “It is possible,... that some bands might stay shared for the foreseeable future”. We believe that maintaining the shared use of these bands, subject to the issues raised below, is in the best interests of spectrum efficiency.

In section 4.7.3, Ofcom also suggests that it will identify spectrum usage rights that reflect the shared nature of the band and then allow trading. At C-band sharing between point-to-point fixed service systems and fixed-satellite earth stations is possible because both point-to-point fixed links and earth stations use highly directional antennas which limit the zone of interference to narrow beams. Furthermore, these beams are essentially orthogonal to each other. These characteristics allow for the very efficient sharing through well established coordination procedures.

Due to the nature of sharing between FSS and FS systems, significant change of use is not possible without upsetting arrangements between existing operators. For example, if mobile operations were introduced or radio fixed access systems were permitted in an increased portion of the band, the situation would be quite different from that described above. Both mobile systems and radio fixed access systems generally require the ability to provide contiguous service over large geographical areas. Such systems therefore employ base stations on central hubs which use omni-directional or sectoral antennas designed to maximise coverage. Hence, if fixed access systems were to be deployed in the bands used by FSS systems and were to be deployed throughout the UK, the potential for the growth in new FSS earth stations will be curtailed.

We note that Ofcom has commenced a consultation on the potential for increasing the use of point-to-multipoint FWA systems in the 3.6 GHz band with the publication of the “Spectrum Framework Review: Implementation Plan”. We are pleased to note that Ofcom has recognised the need for public consultation on potential change of use in this case and suggest that, as a general rule, Ofcom should consult before allowing any change of use. We will respond to the consultation on the implementation plan separately.

Spectrum trading and liberalisation are relatively new concepts and there is very little practical experience. In shared bands, the full extent of any undesirable consequences cannot be known and a careful, step-by-step approach is appropriate. In each case where Ofcom proposes to introduce liberalisation, a consultation with the various stakeholders is necessary.

4 Harmonisation

Satellite systems generally provide service to more than one country and hence harmonisation is required for technical reasons. For a global MSS operator such as Inmarsat, users must be able to operate their mobile earth stations from almost any country in the world. Harmonisation of MSS bands is therefore an absolute necessity. Fortunately, this has been previously recognised and the satellite bands used by Inmarsat are well harmonised at both the global level and the European level. We are pleased to note that Ofcom recognises the practical requirement of harmonisation for satellite services.

There are indeed cases where a system for which harmonisation measures have been agreed has not been successful (such as ERMES and TFTS (Terrestrial Flight Telecommunications System)). But there are also numerous cases where harmonisation has been successful (such as GSM, TV and radio broadcasting, satellite services). There are also cases where UK has deployed systems contrary to the trend in other countries, and there have been negative consequences as a result. One example is the well known “band reversal” issue effecting PMR in the band 450-470 MHz. Another example is the use of the band 14.25-14.5 GHz for fixed links. In most other countries of Europe, this band is available exclusively for satellite services. Even though this band has now been closed to new fixed links in the UK, their operation continues to constrain the use of fixed satellite systems, including VSAT networks, SNG operations, and Earth stations on vessels (ESVs). The extensive use of satellite services in this band was probably not foreseen when the decision was made to permit fixed links in the band 14.25-14.5 GHz, but because UK’s fixed service use was not harmonised with the rest of Europe, this band developed to become primarily a fixed satellite service band. Hence the negative consequences of taking a more independent approach may only appear at a later date. Furthermore, by “going it alone”, the UK faces an increased risk that decisions taken later at an international level will be incompatible with UK use and will isolate the UK market from the single European market.

TFTS is sometimes given as an example of where harmonisation was not successful. It should be noted however that for this application, international harmonisation is a necessity. Although the system was not commercially successful, it would have been impossible to even introduce the service without harmonisation. It should also be noted that one of the TFTS bands, 1670-1675 MHz, has now been harmonised for MSS operations in Europe (through Decision ECC/DEC/(04)09). The availability of the other TFTS band, 1800-1805 MHz, may also allow for a new application to be introduced for which harmonisation is desirable. This is currently subject to an EC mandate and consideration within CEPT. Hence the failure of the predicted application to materialise had the benefit of allowing for the use of the band for at least one, and possibly another, application, for which harmonisation is necessary or desirable. It would therefore be incorrect to take the view that even in the case where the envisaged application does not materialise, there are no benefits to harmonisation.

Ofcom suggests certain mechanisms to improve the conventional approach to harmonisation. We support the use of technology-neutrality and flexibility, but note that it is often very difficult to determine what levels of interference will arise as a result of the introduction of alternative uses of spectrum. In cases where other services in the same or adjacent bands may be affected, it will sometimes be necessary to limit a service to known or foreseen characteristics. We also recognise the benefits of a periodic review. A process of periodic review may allow a Decision to be modified in

the light of technology developments and this may overcome the drawback arising from any lack of flexibility. With respect to satellite services, a stable long-term regulatory situation is necessary to give confidence to investors in new systems. This must be considered in both the timing of a review, and the conditions under which harmonisation measures may be modified or removed.

We do not see the need for “sunset provisions” since a regular review process would be much better able to determine the appropriate timing of the withdrawal of harmonisation measures. This would, for example, allow for modification of the withdrawal date in response to the peaks and troughs in the growth of the telecoms industry. Furthermore, it should also be noted that in practice, many CEPT administrations do not immediately implement ECC Decisions on harmonisation. As an example, ERC Decision (00)05 relates to the exemption of individual licensing by Ku-band VSATs. This decision has been implemented by 21 of the 46 member countries. The UK has not implemented the Decision but has indicated that it may do so at some future date. This band is used by thousands of VSATs throughout Europe, and so the harmonised application can reasonably be considered to be successful. However, it would still be desirable to maintain the Decision, with the objective of improving take-up of the harmonisation measures in the other 25 CEPT member countries. For these reasons we do not support the use of “sunset provisions”.

Ofcom suggests the need for a cost-benefit analysis to demonstrate the justification for harmonisation. We do not believe that a cost-benefit analysis should be the sole, or even the main criterion. The costs and benefits of a future system will be very difficult to determine with accuracy and the range of error is therefore likely to be very high². This is particularly the case when considering a hypothetical alternative use and more so when the uses are quite different, such as satellite and terrestrial.

Ofcom should ensure that a range of radio communication services is available to UK business and citizens. For the customers of mobile satellite services, there is generally no alternative application that can meet their requirements. Inmarsat’s customers require voice and data communications from almost any location - often beyond the reach of any terrestrial networks. This is most obviously the case for air and maritime users, but is also the case for land based users. If spectrum potentially available for mobile satellite services was unavailable due to lack of international harmonisation, many MSS users would not have their communications requirements fulfilled.

Mobile satellite systems also provide social and humanitarian benefits by providing distress and safety communications for ships and aircraft and by providing emergency communications to facilitate relief operations in parts of the world hit by disasters. The economic benefits of such services may be impossible to measure.

² An example would be the recent case of the bands 1781.7-1785.0 / 1876.7-1880.0 MHz, where Ofcom commissioned an economic study by NERA, which estimated a net present value of £943m for low-power GSM use over 10 years. Ofcom has in its recent consultation document “Spectrum Framework Review: Implementation Plan” indicated that it believes the benefits to be over estimated and that the actual benefits are “at least as great as the wide area option”: i.e. £128m. This is a huge range of uncertainty.