GSOA
GLOBAL SATELLITE OPERATORS ASSOCIATION

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GSOA response to UK Ofcom consultation "Enabling spectrum sharing in the upper 6 GHz band"

1. Introduction

The Global Satellite Operator's Association (GSOA) welcomes the opportunity to respond to Ofcom's consultation on Enabling spectrum sharing in the upper 6 GHz band. GSOA is the global platform for collaboration between satellite operators. As the world's only CEO-driven satellite association, GSOA leads the sector's response to global challenges and opportunities. It offers a unified voice for the world's largest operators, important regional operators and other companies that engage in satellite-related activities. GSOA would like to offer some general observations for consideration of Ofcom in Section 2. Section 3 contains responses to the specific consultation questions.

2. General comments

2.1 Interference from terrestrial systems to FSS satellites

The upper 6 GHz band is used for a range of FSS applications. This includes use by GSO satellites for uplinks using global or continental coverage beams, providing high reliability communications over wide geographic areas. The upper 6 GHz band is also widely used for telecommand links to support the operation of satellites which have communication links in other bands. Interference to those links may prevent to ensure proper control of the satellites.

The use of the upper 6 GHz band includes feeder links for MSS systems. For example, Inmarsat uses parts of this band for feeder uplinks which are necessary for its L-band MSS service. This includes vital safety-related L-band services, including the GMDSS and AMS(R)S which are necessary for maritime and aviation operations. Interference to these feeder uplinks is translated at the satellite to interference to the L-band downlink signals, and hence excessive interference at the satellite in the 6 GHz band would also impact on the users of those L-band services – potentially preventing service for users in the UK and for ships and aircraft operating globally.

Part of the upper 6 GHz band, specifically 6725-7025 MHz, is covered by the RR Appendix 30B plan, which guarantees for all ITU administrations access to the GSO orbit in this band for FSS uplinks. The UK has an allotment for a satellite at 37.1°W, with a small spot beam pointed to UK, that could be rendered unusable by terrestrial systems in the UK if not carefully controlled. Irrespective of Ofcom's policy towards the UK allotment, other countries should be entitled to make use of their allotments without interference from terrestrial systems.

All the above satellite applications – current and planned – must be protected from potential interference risks from terrestrial systems using the upper 6 GHz band in the UK and other countries.

For the lower 6 GHz band (5925-6425 MHz) CEPT has studied and agreed power limits for RLAN systems in ECC Decision (20)01, with limits defined for "low power indoor" devices and "very low

power" devices. CEPT has recently agreed a new work item to examine the technical aspects of deployment of RLAN devices in the upper 6 GHz band, which will examine, among other things, the possible interference to satellite uplinks.

GSOA is aware of the interest in the upper 6 GHz band for 5G mobile networks and is actively participating in the studies on this issue in the ITU as a part of WRC-23 agenda item 1.2. While the work is ongoing in ITU-R Working Party 5D, GSOA's studies and those of some administrations show significant interference risks from proposed 5G systems to satellite receivers. That is not surprising given that 5G stations transmit with significantly higher power, typically 74 dBm EIRP for a 5G macro base station, compared with 14 dBm for outdoor RLAN devices. This is also despite the fact that the ITU studies assume very low and actually unrealistic coverage by 6 GHz IMT systems – between 0.15% and 2% geographic coverage.

It is necessary to be particularly cautious about interference to satellite uplinks since, if it were to occur, it would be very difficult to eliminate it. A typical global satellite beam receives interference from a very wide geographical area – for example a satellite around 60°E sees all of Europe, Africa, the Middle East and part of the Asia Pacific region. Since interference at the satellite may be due to aggregated interference from multiple countries within the satellite beam, it would be practically impossible to determine responsibility and have administrations take action to reduce interference after terrestrial systems have been authorised.

We note that Ofcom wishes to keep open the option for 5G deployment in the future, but in GSOA's view the study results are already clear and 5G can be discarded for possible deployment in the UK in the upper 6 GHz band.

2.2 Interference from terrestrial systems to FSS earth stations

Although parts of the upper 6 GHz band are also allocated to the FSS for non-GSO MSS feeder downlinks, Ofcom has identified that no receiving earth stations are licensed in the UK. Interference from any terrestrial systems to non-GSO MSS feeder downlinks would be a concern in areas where such earth stations exist.

2.3 Interference from FSS earth stations to terrestrial systems

There is the potential for interference from FSS earth stations in the UK to the new shared access licence users proposed by Ofcom. GSOA therefore seeks to ensure that this new use will not constrain those earth station operations or constrain future requirements for new earth stations or new frequencies at existing earth stations.

3. Answers to Consultation questions

1. Do you agree with our proposals to add the 6425-7070 MHz band to the Shared Access framework?

GSOA agrees with the idea of shared access licences in the upper 6 GHz band. We suggest however a small adjustment to the power limits, to align the limits with those adopted by CEPT for the lower 6 GHz band. For indoor devices, that means limits of 23 dBm EIRP and 10 dBm/MHz EIRP density, in

place of the limits proposed by Ofcom (24 dBm EIRP and 11 dBm/MHz EIRP density). These lower limits should provide adequate protection to satellite uplinks.

2. Do you have any comments on potential uses for this licence?

GSOA has no comment on this question.

3. Do you have any comments on our proposed licence conditions, licence fee or minimum separation distance?

As noted in our answer to question 1, GSOA suggests a small adjustment to the power limits, to align with the limits adopted by CEPT for the lower 6 GHz band. That is power limits of 23 dBm EIRP and 10 dBm/MHz EIRP density.

New shared access licensed users could receive interference from licensed FSS earth stations operating in the upper 6 GHz band. Ofcom has identified that 73 earth stations operate at 20 sites. GSOA was not able to find in the consultation document reference on how any case of interference from FSS earth stations to new shared access licensees would be addressed. While the condition that devices are restricted to indoor use will clearly limit the scope for interference to occur, the risk cannot be excluded. GSOA proposes that the devices operating under the new shared access licence are *not* entitled to protection from satellite earth stations, and this condition should be explicitly established in the licence conditions.

4. Do you have any comments on our technical analysis?

GSOA agrees that ECC Report 302 is a good basis for consideration of interference to satellite uplinks in the upper 6 GHz band. As stated above, GSOA suggests that Ofcom adopts the same limits as those in Report 302 for indoor devices.

Your response

Question	Your response
	GSOA is adding an expanded contribution attached that serves to inform the below responses. Please refer to it for more information.
Question 1: Do you agree with our proposals to add the 6425-7070 MHz band to the Shared Access framework?	GSOA agrees with the idea of shared access licences in the upper 6 GHz band. We suggest however a small adjustment to the power limits, to align the limits with those adopted by CEPT for the lower 6 GHz band. For indoor devices, that means limits of 23 dBm EIRP and 10 dBm/MHz EIRP density, in place of the limits proposed by Ofcom (24 dBm EIRP and 11 dBm/MHz EIRP density). These lower limits should provide adequate protection to satellite uplinks.
Question 2: Do you have any comments on potential uses for this licence?	GSOA has no comment on this question
Question 3: Do you have any comments on our proposed licence conditions, licence fee or minimum separation distance?	As noted in our answer to question 1, GSOA suggests a small adjustment to the power limits, to align with the limits adopted by CEPT for the lower 6 GHz band. That is power limits of 23 dBm EIRP and 10 dBm/MHz EIRP density. New shared access licensed users could receive interference from licensed FSS earth stations operating in the upper 6 GHz band. Ofcom has identified that 73 earth stations operate at 20 sites. GSOA was not able to find in the consultation document reference on how any case of interference from FSS earth stations to new shared access licensees would be addressed. While the condition that devices are restricted to indoor use will clearly limit the scope for interference to occur, the risk cannot be excluded. GSOA proposes that the devices operating under the new shared access licence are *not* entitled to protection from satellite earth stations, and this

	condition should be explicitly established in the licence conditions.
Question 4: Do you have any comments on our technical analysis?	GSOA agrees that ECC Report 302 is a good basis for consideration of interference to satellite uplinks in the upper 6 GHz band. As stated above, GSOA suggests that Ofcom adopts the same limits as those in Report 302 for indoor devices.