



ESOA response to Ofcom consultation:

“Public Sector Spectrum Release (PSSR) Technical coexistence issues for the 2.3 and 3.4 GHz award”

14 May 2014

The European Satellite Operators Associations (ESOA) is pleased to provide its comments in response to the Ofcom consultation document “Public Sector Spectrum Release (PSSR) Technical coexistence issues for the 2.3 and 3.4 GHz award”. ESOA’s comments are limited to the issue of potential adjacent band interference to permanent earth stations operating in the band above 3.6 GHz. Interference could occur from potential new users of the 3.4 GHz band or from UK Broadband under new licence conditions.

We note that Ofcom is considering applying the new technical conditions being considered for inclusion in a revised version of Commission Decision 2008/411/EC (recently published as Commission Implementing Decision 2014/276/EU). These technical conditions are significantly more relaxed than those in the current Decision, particular with regard to the out-of-band emissions. A detailed comparison is shown in the Annex. Applying this new Block Edge Mask (BEM) for mobile base stations in the 3.4 GHz band will significantly increase the risk of interference to UK permanent earth stations.

While Ofcom has conducted technical studies into potential interference, the analysis appears to have underestimated the risk of interference to earth stations. CEPT studies into the impact on FSS earth stations from terrestrial systems subject to the proposed new technical conditions are contained in ECC Report 203. The results of those studies (Table 73 of Report 203) show that separation distances are up to 80 km in the case of adjacent channel interference, and up to 30 km in the case of LNA/LNB saturation. Ofcom has calculated much smaller separation distances of 8.5 km in the case of interference from out-of-band emissions (para 12.43), and 8 km in the case of LNA/LNB blocking (para 12.47).

Whatever the correct separation distances, there is clearly a risk of interference being caused to UK permanent earth stations if the terrestrial station is located within a number of km of the earth station. Whichever BEM is applied, we support that the licensee of any new terrestrial stations should be required to ensure protection to existing permanent earth stations. This requirement should be clearly defined and explicitly stated in the licence conditions.

In section 12 of the consultation document, Ofcom discusses three policy options related to the conditions to protect permanent earth stations from interference. Option 1 would retain the current licence conditions, which include the lower out-of-band emission limits compared with the proposed new limits. Option 2 would replace the current licence conditions applying below 3600 MHz with the more relaxed BEM proposed in CEPT Report 49 and would not mandate specific coordination requirements on the licensee of the terrestrial service. Option 3 would apply the more relaxed BEM and would place a mandatory coordination requirement on terrestrial operator using the band 3580-3600 MHz.

It is most important that permanent earth stations are adequately protected from interference from new terrestrial systems, and it is fair and usual practice that the responsibility should be on the operator of the new (terrestrial) stations to protect the existing earth stations. It would also be fair that if the terrestrial stations are subject to the more relaxed emission limits, the negative impact falls on the terrestrial operator – not on the other users of the adjacent frequency bands such as PES operators. It is not at all clear why Ofcom, in para 12.78 considers that a mandatory coordination procedures on terrestrial licensees to protect the five C-band PES locations in the UK would not be proportionate. If Ofcom is correct that the required separation distances are small, and potential interference issues can be easily resolved, a requirement on the licensee of the terrestrial service to coordinate with the PES licensee would not be onerous. A mandatory coordination requirement would not prevent local solutions to be developed between the relevant parties but would provide some legal certainty and clear responsibility that should ensure that interference is not caused. Option 2, Ofcom's preferred option, would apparently not require the terrestrial operator to take action to avoid interference before it is caused, placing UK permanent earth stations at unnecessary risk of interference.

Therefore ESOA does not support Option 2, as referred to in Question 12.5 of the consultation document. ESOA proposes that the licence conditions for the terrestrial service operator should require coordination of new terrestrial stations with the operators of UK permanent earth stations. A simple coordination distance should be applied, dependent on the level of the limits on the out-of-band emissions – i.e. if the current BEM continues to apply, the coordination distance would be smaller, and if the proposed new, higher, BEM is applied, then the coordination distance would be larger.

Furthermore, it should be noted that the deployment of fixed or mobile systems in the 3.4 GHz band may require coordination with respect to earth stations located in other countries operating in the same band. In accordance with the ITU Radio Regulations, before any terrestrial stations are deployed within the coordination area of an FSS earth station operating on the same frequencies, coordination is required to ensure that interference is not caused. If the coordination area for an earth station deployed in (for example) France, Belgium or the Netherlands overlaps with UK territory, coordination is required before any terrestrial stations are deployed in the overlapping

area. Ofcom should ensure that such coordination requirements are put into place, consistent with the UK's obligations under the Radio Regulations. We also suggest that the requirement for prior coordination with any earth stations in other countries should be included in the conditions associated with the licences of terrestrial systems in the 3.4 GHz band.

ESOA thanks Ofcom for the opportunity to comment, and asks that Ofcom gives full consideration to the comments and proposals above.

Annex

Comparison of base station power limits in 2008/411/EC with those in CEPT Report 49

The following compares the in-band and out-of-band power limits for mobile base stations in 2008/411/EC with those proposed in CEPT Report 49. Some limits are expressed as output power and some limits are expressed as EIRP. Furthermore, the limits in 2008/411/EC are expressed in a bandwidth of 1 MHz, whereas the limits in CEPT Report 49 are expressed in a 5 MHz reference bandwidth. To allow for a like-for-like comparison, the limits in each document are translated to EIRP values expressed in dBm in 5 MHz reference bandwidth.

“Central Station” limits in 2008/411/EC

	Limits in 2008/411/EC	Equivalent in 5 MHz	Expressed as EIRP, (assuming 18 dBi base station antenna)
Inband power spectral density limits (EIRP)	+53 dBm/MHz <i>[see Table 2 in the Annex to the Decision]</i>	+60 dBm/5 MHz	+60 dBm/5 MHz
1st Adjacent block (Tx output power density)	-47 dBm/MHz <i>[see section B of the Annex to the Decision]</i>	-40 dBm/5 MHz	-22 dBm/5 MHz
2nd Adjacent block (Tx output power density) (also applies for larger frequency separations)	-59 dBm/MHz <i>[see section B of the Annex to the Decision]</i>	-52 dBm/5 MHz	-34 dBm/5 MHz

It may be noted that the value of the out-of-band emissions assumed in ECC Report 100 for the base station is a maximum of -60 dBW/MHz EIRP, which is equivalent to -23 dBm/5 MHz EIRP, consistent with the value in the table above for the 1st adjacent block *[see Table 5.4.9 in ECC Report 100]*. This value is used in consideration of the separation distance required to protect FSS earth stations from the unwanted emissions by a BWA Central Station.

Proposed limits in CEPT Report 49

	Central station	Equivalent maximum eirp in 5 MHz	Note
Inband power spectral density limits	Not obligatory. In case an upper bound is desired by an administration, a value	+68 dBm/5 MHz	

	of 68 dBm/5 MHz per antenna may be applied. [Table 2 in Report 49]		
1st Adjacent block	$\text{Min}(P_{\text{Max}} - 40, 21)$ dBm/5 MHz e.i.r.p. per antenna [see Table 4 in Report 49]	+21 dBm/5 MHz	The limit value of 21 dBm applies if P_{MAX} (EIRP) is greater than or equal to 61 dBm. Otherwise, the limit value is lower.
2nd Adjacent block	$\text{Min}(P_{\text{Max}} - 43, 15)$ dBm/5 MHz e.i.r.p. per antenna [see Table 4 in Report 49]	+15 dBm/5 MHz	The limit value of 15 dBm applies if P_{MAX} (EIRP) is greater than or equal to 58 dBm. Otherwise, the limit value is lower.
“Baseline”	$\text{Min}(P_{\text{Max}} - 43, 13)$ dBm/5 MHz e.i.r.p. per antenna [see Table 3 in Report 49]	+13 dBm/5 MHz	The limit value of 13 dBm applies if P_{MAX} (EIRP) is greater than or equal to 56 dBm. Otherwise, the limit value is lower.

Comparison (EIRP values in dBm/5 MHz)

	2008/411/EC	Report 49	Difference (dB)
Inband power spectral density limits	+60	+68	8
1st Adjacent block	-22	+21	43
2nd Adjacent block	-34	+15	49
“Baseline”	-34	+13	47

Summary

In comparison with the limits in 2008/411/EC, the CEPT Report 49 inband limits are higher by 8 dB. The CEPT Report 49 out-of-band limits are higher by between 43 and 49 dB.