

The Response from Motorola Ltd.

to the Consultation on

The Licence-Exemption Framework Review

June 21st 2007.

Key Points

1. The introduction of the concept of a version of Commons in which the possible applications would be divided into multiple classes rather than a true “commons” approach opens concerns over how such applications classes would be defined in a fair and equitable way.
2. The proposal to associate each applications class to specific spectrum bands may result in significant loss of the advantages of converged service delivery.
3. That within the framework it is made absolutely clear that licence-exempt underlay services are permitted on a non-interference, non-protection basis in all cases.
4. Detect-and-Avoid (DAA) mitigation is only a valid approach for some service types and even then is only effective in very specific and limited cases. DAA requires an extensive knowledge of the victim services and their potential usage to characterise the likely effectiveness. This information could very well not be available. Even with such information, extensive testing is required to establish the viability of the mitigation scheme. In general, time dependent services are likely to suffer interruptions due to the application of DAA strategies and thus should perhaps be better located on other spectrum where it would be the primary service.
5. It is not appropriate to broadly allow licence exempt use for devices based on limits equivalent to the recent UWB arrangements. It is proposed that such limits implement the full detail as provided in the EU Decision¹ whereby appropriate date limits, duty cycles and other mitigation techniques are mandated. These limits could be further revised to accommodate other services in bands where interference is predicted.
6. That the Framework be enhanced to include reviews of the permitted power levels etc. in cases where even though the underlay services are compliant to the current regulations, the introduction of these services causes interference to the prime users. To this end an appropriate definition of Harmful Interference may be required. Achieving such a definition across all the potential users could be problematic as they have different operational requirements.

¹ 2007/131/EC

Responses to Consultation Questions

Q1: Do you agree that the spectrum commons model should be the preferred approach for licence-exempt use of spectrum, and that application-specific allocations should only be considered where technical constraints or safety issues require this?

This appears to be slightly mis-aligned with the consultation proposals of section 4.5. The consultation does not propose the introduction of true “commons” but of the definition of classes of applications which would be grouped together and permitted in bands. This approach to be for the better protection of the services against interference.

The introduction of a true “commons” approach could present considerable difficulty in the light of the permitted power proposed in certain bands under the UWB model as noted in the proposals.

Q2: Do you agree with the proposal for multiple classes of spectrum commons?

While Motorola agrees with the objective of enhancing the usability and certainty of unlicensed use by applying certain sharing protocols, this proposal could be problematic, if not implemented with great care. It is agreed this approach could simplify the interference predictions slightly, there would be additional complications arising from some converged service delivery strategies that had hoped to take advantage of the future service neutral environment, it could also cause problems of principle under the technology neutrality concept and of course International roaming (see below) were that same arrangements not mimicked elsewhere.

Motorola agrees that sharing between license exempt devices would be enhanced by limiting use of bands to devices that share or operate in a similar fashion. Care must be taken, however, to avoid overly stringent regulations that limit innovation or give an advantage to a very narrowly defined technology.

If license exempt use is to be permitted in bands used by primary licensed services, great care must be taken to ensure that the technical and operating requirements for the license exempt devices fully protect the primary services. It appears unlikely that a spectrum commons model could be applied to underlay services operating in licensed bands.

The further recommendation (4.5(2)) that the regulator be made responsible to define (at a high level) the politeness rules, limiting the diversity of applications within each class appears to place an extremely high burden of responsibility on the regulator and open them to the issues surrounding preference being given to one service over another. This arises because protocols such as Detect-and-Avoid (DAA) are definitely not suitable for many types of service.

Using the case of low power spread-spectrum devices such as UWB as an example, unless the low power underlay service is mandated to have receivers of a reasonable performance, it is entirely possible that the sensitivity is insufficient to detect the presence of a signal from the primary service except

at close range (because the spread-spectrum device normally uses a very wide band receiver). Thus it believes it is operating in clear spectrum and so does not turn off when it should and so harmfully interferes with the primary service, potentially drastically cutting the operational range and the value derived.

It is therefore a logical requirement that underlay services permitted by virtue of a “Detect and Avoid” mitigation regime, should be fitted with a receiver capable of actually detecting the protected service at the right power level.

We stress that the viability of license exempt use in a band will depend on the primary service. It can not be assumed that licensed exempt use of a band is always feasible because it may be too difficult to avoid impacting the primary service.

Q3: Do you agree with the distinction made between the licence-exemption and light-licensing regimes?

Light licensing provides the opportunity to stop the further deployment of services in certain bands once it is deemed that a maximum limit has been reached.

As noted above, an over reliance on DAA schemes to ensure co-existence would appear to be fundamentally flawed. While it may be effective and appropriate in certain situations, it will be ineffective in protecting primary services many situations as well as negatively impacting the licensed exempt use.

Q4: Do you agree with the view that the licence-exemption and light-licensing regimes will converge in the future?

At this stage it appears they address very different requirements and so it is not clear how this could be the case.

We do not agree that it is possible at this stage to instigate a policy of default conversion to licence-exemption (5.3(2)) because light licensing addresses the need to limit the total number of deployed devices in some bands that are deemed to need that limit and Detect and Avoid strategies are fundamentally flawed for many types of content delivery.

Q5: Do you agree with the proposed mixture of licence-exempt and light-licensed use of the 105–275 GHz spectrum? Do you agree with the bands that have been identified for such use?

No comment

Q6: Do you agree with the view that the use of the 275–1000 GHz spectrum should be licence-exempt?

No comment

Q7: Do you agree with the view on the levels of future demand for licence-exempt usage in the 40–105 GHz spectrum? Do you agree that the Group-A bands identified above should be considered for licence-exempt use? Do you agree that licence-

exempt and light-licensed use of the Group-C bands identified above should only be considered when there is evidence of demand for such use?

No comment

Q8: Do you think it could be desirable for transmissions at levels below certain power spectral density limits to be exempt from licensing?

This appears very problematic and liable to result in harmful interference.

We note the graph of Figure 7² in the consultation in which it is shown that other wideband systems utilise higher transmit powers. We do not see the relevance of this in the light of the proposal. Figure 7 clearly shows that the bands for these other higher power wideband services have been carefully chosen to avoid exactly the problems highlighted in this response and which protection would be lost in the event that an underlay approach were to be adopted. Furthermore and even more important, an examination of the transmit powers completely fails to properly portray the fact that interference will occur due to the close proximity of the underlay service transmissions to the receivers of the primary service.

Q9: Do you agree with the transmission limits proposed in this document?

No. We note that even the EU Decision³ had many caveats against the simple adoption of such limits. A copy of the summary table from the Decision follows for your convenience:

² Page 45.

³ 2007/131/EC

ANNEX

1. Maximum e.i.r.p. densities in the absence of appropriate mitigation techniques

Frequency range (GHz)	Maximum mean e.i.r.p. density (dBm/MHz)	Maximum peak e.i.r.p. density (dBm/50 MHz)
Below 1,6	- 90,0	- 50,0
1,6 to 3,4	- 85,0	- 45,0
3,4 to 3,8	- 85,0	- 45,0
3,8 to 4,2	- 70,0	- 30,0
4,2 to 4,8	- 41,3 (until 31 December 2010) - 70,0 (beyond 31 December 2010)	0,0 (until 31 December 2010) - 30,0 (beyond 31 December 2010)
4,8 to 6,0	- 70,0	- 30,0
6,0 to 8,5	- 41,3	0,0
8,5 to 10,6	- 65,0	- 25,0
Above 10,6	- 85,0	- 45,0

2. Appropriate mitigation techniques

A maximum mean e.i.r.p. density of - 41,3 dBm/MHz is allowed in the 3,4 to 4,8 GHz bands provided that a low duty cycle restriction is applied in which the sum of all transmitted signals is less than 5 % of the time each second and less than 0,5 % of the time each hour, and provided that each transmitted signal does not exceed 5 milliseconds.

Equipment using ultra-wideband technology may also be allowed to use the radio spectrum with e.i.r.p. limits other than those set out in the table in point 1 provided that appropriate mitigation techniques other than those set out in the first sub-paragraph are applied with the result that the equipment achieves at least an equivalent level of protection to that provided by the limits in the table set out in point 1.

We note that even this outcome was the result of intense debate with the deployment of UWB in some of the bands being agreed only under the condition that it be date-limited to a point at which it was estimated that the intended service would be deployed to a much greater extent than today. Thus the UWB would be withdrawn to avoid harmful interference with the intended service as it comes on stream.

The application of strict limitations in duty cycle were intended to permit certain specific applications where it was thought the potential loss of up to 18 seconds of service an hour to be less harmful (but note that 600MHz of spectrum was even so time-limited in availability for UWB).

Our conclusion is that the Framework should apply at least all these restrictions or their equivalent as required under the Decision.

Q10: Do you agree with the harmonisation strategy discussed above in the context of licence-exempt devices?

It is extremely difficult to reconcile the International harmonisation strategy with the policy of grouping applications into multiple classes directed towards certain bands. The problem being that unless this Framework is also adopted Internationally in the same manner with the same outcomes, the UK could become technologically isolated.

We note that an additional major advantage of harmonisation is in the convenience it provides to devices or users who roam Internationally.

It is generally accepted that harmonization will increase the global market for some unlicensed devices and may help reduce the cost for even non-roaming devices, but that this is only a valid expectation if harmonization is done in such a manner that there are no technical difference with other regions of the world.

Q11: Do you agree with the view that no additional regulatory instruments, beyond those available today, are required for the protection of licence-exempt equipment?

We support the principle of the deployment of licence-exempt service under a no-interference, no protection regime.

Questions on this response should be sent, in the first instance, to

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