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RADIO SPECTRUM COMMITTEE

Working Document

Subject: Draft Commission Implementing Decision on the harmonised technical conditions for the use of 2300-2400 MHz band for terrestrial systems capable of providing electronic communications services in the Union

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COMMISSION IMPLEMENTING DECISION

of **XXX**

on the harmonised technical conditions for the use of 2300-2400MHz band for terrestrial systems capable of providing electronic communications services in the Union

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)¹, and in particular Article 4(3) thereof,

Whereas:

- (1) Decision No 243/2012/EU of the European Parliament and the Council² establishes a multiannual Radio Spectrum Policy Programme (RSPP) and sets the objective of ensuring that sufficient spectrum for coverage and capacity purposes is available within the Union, in order to enable the Union to have the fastest broadband speeds in the world, thereby making it possible for wireless applications and European leadership in new services to contribute effectively to economic growth, and to achieving the target for all citizens to have access to broadband speeds of not less than 30 Mbps by 2015.
- (2) The RSPP sets the target of identifying at least 1200 MHz of spectrum suitable for wireless broadband in the Union by 2015.
- (3) The Radio Spectrum Policy Group recommended to the Commission in its Opinion on strategic challenges facing Europe in addressing the growing spectrum for wireless broadband³ the development of harmonised implementation measures and the adoption of complementary measures to promote shared use of the band between wireless broadband applications and other services for the 2.3-2.4GHz band.
- (4) The band 2300-2400 MHz is allocated to the Mobile Service on a co-primary basis by the ITU Radio Regulations in all three ITU regions and footnote 5.384A of the Radio Regulations identifies this frequency band for International Mobile Telecommunications (IMT). Existing use of the 2300-2400 MHz frequency band in the Union includes telemetry (terrestrial and aeronautical); fixed links, governmental use including unmanned aircraft systems (UAS) and closed-circuit television (CCTV), programme making and special events (PMSE) ancillary video links as well as amateur radio as a secondary service.
- (5) In order to use spectrum more efficiently and to cope with existing use in the 2300-2400 MHz band the regime of licensed shared access (LSA) has been recommended for both new and existing uses, by the Radio Spectrum Policy Group in its Opinion on

¹ OJ L 108, 24.4.2002 p. 1.

² Decision No 243/2012/EU of the European Parliament and the Council of 14 March 2012 establishing a multiannual radio spectrum policy programme (OJ L 81, 21.3.2012, p. 7).

³ Document RSPG13-521 rev1

Licensed Shared Access⁴. Implementation of such regime at national level might lead to additional restrictions for wireless broadband, which remain limited in such a way that they do not have an impact on the manufacturing of equipment.

- (6) Pursuant to Article 4(2) of Decision No 676/2002/EC, the Commission gave on 8 April 2014 a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT) to develop harmonised technical conditions in the 2300-2400 MHz frequency band for wireless broadband electronic communications services in the EU.
- (7) In response to that mandate, on 28 November 2014, CEPT issued a Report (CEPT Report 55). That Report defines harmonised technical conditions for a Block Edge Mask (BEM) as well as a suitable channelling arrangement for wireless broadband electronic communications services in this band within the EU.
- (8) The results of the Commission mandate to the CEPT should be applied across the Union and implemented by Member States without delay in order to ensure take up of the 2300-2400 MHz frequency band for wireless broadband.
- (9) Cross-border agreements may be necessary to ensure the implementation by MS of harmonised parameters so as to avoid harmful interference between systems located in different MS or neighbouring countries and to improve spectrum efficiency and convergence in spectrum use.
- (10) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee,

HAS ADOPTED THIS DECISION:

Article 1

This Decision aims at harmonising the conditions for the availability and efficient use of the frequency 2300-2400 MHz band for terrestrial systems capable of providing electronic communications services in the Union.

Article 2

For the purposes of this Decision:

'Licensed shared access (LSA)', means a regulatory approach aiming to facilitate the introduction of radio communication systems operated by a limited number of licensees under an individual licensing regime in a frequency band already assigned or expected to be assigned to one or more existing holders of spectrum rights. Under the licensed shared access (LSA) approach, the additional users are authorised to use the spectrum (or part of the spectrum) in accordance with sharing rules included in their rights of use of spectrum, thereby allowing all the authorized users, including existing users, to provide a certain quality of service.

Article 3

1. No later than six months after the entry into force of this Decision, Member States shall designate and make available, on a non-exclusive basis, the 2300-2400 MHz

⁴ Document RSPG13-538

frequency band for terrestrial systems capable of providing electronic communications services, in compliance with the parameters set out in the Annex.

2. Member States shall ensure that the systems, referred to in paragraph 1, can coexist with existing systems within the band and adjacent bands.
3. Member States shall assess, on an individual basis, the suitability and feasibility of implementing a licensed shared access⁵ regime for new and existing users. Any possible restrictions resulting therefrom for wireless broadband communication shall be limited to time of operation and/or geographical location. These restrictions shall not have an impact on the manufacturing of equipment in line with the technical conditions set out in the Annex.
4. Member States shall facilitate cross-border coordination agreements with the aim of enabling the operation of the systems referred to in paragraph 1 and taking into account regulatory procedures and rights as well as relevant international agreements.

Article 4

Member States shall report to the Commission on the implementation of this Decision within 3 months after the deadline set in article 3. They shall also keep the use of the 2300-2400 MHz frequency band under scrutiny and report their findings to the Commission to allow regular and timely review of this Decision.

Article 5

This Decision is addressed to the Member States.

Done at Brussels,

For the Commission

Günther H. Oettinger

⁵ Document RSPG13-521 rev1

ANNEX

A. General parameters

1. The mode of operation within the 2300-2400 MHz frequency band shall be Time Division Duplex (TDD).
2. The assigned block sizes within the 2300-2400 MHz frequency band shall be in multiples of 5 MHz. The lower frequency limit of an assigned block shall be aligned with or spaced at multiples of 5 MHz from the lower band edge of 2300 MHz.
3. Base station transmission shall be in compliance with the Block Edge Mask in this Annex.

B. Technical conditions for base stations

B.1 General principles

The following technical parameters for base stations, called block edge mask (BEM), are an essential component of conditions necessary to ensure coexistence between neighbouring networks in the absence of bilateral or multilateral agreements between operators of such neighbouring networks. Less stringent technical parameters, if agreed among the affected parties, may also be used provided that these parameters comply with the technical conditions applicable for the protection of other services or applications, including in adjacent bands or subject to cross-border obligations.

A BEM is an emission mask that is defined as a limit on the average e.i.r.p.(equivalent isotropic radiated power)⁶ or TRP (total radiated power)⁷, as a function of frequency, relative to the edge of a block of spectrum that is licensed to a mobile/fixed communications operator. It consists of in-block and out-of-block components which specify the permitted emission levels over frequencies inside and outside the licensed block of spectrum respectively. The term 'block edge' refers to the frequency boundary of spectrum licensed to an operator. The term 'band edge' refers to the boundary of a range of frequencies allocated for a certain use (e.g. 2300 MHz is the lower band edge for systems harmonised by this decision).

The block edge mask (BEM) has been designed to allow coexistence between various systems providing electronic communication services in the 2300-2400 MHz band and ensure coexistence with the applications above 2400 MHz. It does not take into account coexistence with adjacent services below 2300 MHz or ensure coexistence with other existing services inside the band 2300-2400 MHz. When the block edge mask does not provide the required level of protection to existing use of the 2300-2400 MHz frequency band, additional restrictions applied by Member States shall comply with Article 3, paragraph 3.

⁶ "e.i.r.p." means equivalent isotropically radiated power, which is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

⁷ TRP is a measure of how much power the antenna actually radiates. The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere. For an isotropic antenna radiation pattern, e.i.r.p. and TRP are equivalent. For a directional antenna radiation pattern, e.i.r.p. in the direction of the main beam is (by definition) greater than the TRP.

The BEM shall be applied as an essential component of the technical conditions necessary to ensure coexistence between services at a national level.

B.2 Block Edge Mask (BEM)

Technical conditions are applicable to WBB base stations (BS) with different power levels (macro, micro, pico and femto⁸). The block edge mask (BEM) for a specific block is obtained by combining the:

1. In-block requirements in section B.2.1;
2. Baseline requirements in section B.2.2;
3. Transitional region requirements in section B.2.3, if applicable.

B.2.1 In-block requirements

The block assigned to the operator.

- **2300-2390 MHz:** An in-block e.i.r.p. limit is not obligatory. In case an upper limit is desired by a Member States, a value which does not exceed 68 dBm/5MHz e.i.r.p. per antenna may be applied.
- **2390-2400 MHz:** The in-block e.i.r.p. limit shall not exceed 45 dBm/5MHz to ensure coexistence with systems above 2400 MHz.
- For femto base stations, the use of power control mitigation technique is mandatory in order to minimise interference to adjacent channels.

⁸ These terms are not uniquely defined and refer to cellular base stations with different power levels, which decrease in the following order: macro, micro, pico, femto, In particular, femto cells are small base stations with the lowest power levels, which are typically used indoors.

B.2.2 Baseline requirements

The spectrum used for Time Division Multiplexing (TDD), except from the operator block in question and any corresponding transitional regions⁹.

Table 1

Base Station out-of-block e.i.r.p. limits over other blocks within the band 2300-2400MHz

Frequency range	Maximum mean e.i.r.p.	Measurement bandwidth
Unsynchronised TDD blocks (2300-2400MHz)	-36 dBm	5 MHz
Synchronised ¹⁰ TDD blocks (2300-2400MHz)	Min($P_{\text{Max}}^{11} - 43, 13$) dBm per antenna	5 MHz

Table 2

Base Station out-of-band e.i.r.p. limits above 2403MHz

Base Station e.i.r.p.	Maximum mean e.i.r.p.	Measurement bandwidth
$P_{\text{Max}} > 42$ dBm	1 dBm	5 MHz
$24 \text{ dBm} < P_{\text{Max}} \leq 42$ dBm	$(P_{\text{Max}} - 41)$ dBm	5 MHz
$P_{\text{Max}} \leq 24$ dBm	-17 dBm	5 MHz

⁹ In case of unsynchronised adjacent blocks, one operator's out-of-block signal level shall be reduced to the baseline level before entering into another operator's block.

¹⁰ Synchronised operation means "operation of TDD in two different systems, where no simultaneous uplink and downlink occur". Synchronisation of TDD networks of different operators is to be addressed at national level.

¹¹ P_{Max} is the maximum carrier power for the base station, measured as e.i.r.p.

B.2.3 Transitional region requirements (if applicable)

The transitional region applies either in the case of synchronised¹² adjacent blocks, or in-between unsynchronised TDD blocks that are separated by 5 or 10 MHz.

For immediately adjacent unsynchronised TDD networks, there is no transitional region and the baseline levels apply outside the allocated block. The transitional region requirements also do not apply below 2300 MHz or above 2400 MHz.

Table 3

Base Station out-of-block e.i.r.p. limits

Frequency range	Maximum mean e.i.r.p.	Measurement bandwidth
-5 to 0MHz offset from lower block edge 0 to 5MHz offset from upper block edge	$\text{Min}(P_{\text{Max}}^{13} - 40, 21)$ dBm per antenna	5 MHz
-10 to -5MHz offset from lower block edge 5 to 10MHz offset from upper block edge	$\text{Min}(P_{\text{Max}} - 43, 15)$ dBm per antenna	5 MHz

¹² Synchronised operation means “operation of TDD in two different systems, where no simultaneous uplink and downlink occur”. Synchronisation of TDD networks of different operators is to be addressed at national level.

¹³ P_{Max} is the maximum carrier power for the base station, measured as e.i.r.p.