COMMISSION IMPLEMENTING DECISION

of 2 May 2014

on amending Decision 2008/411/EC on the harmonisation of the 3 400-3 800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community

(notified under document C(2014) 2798)

(Text with EEA relevance)

(2014/276/EU)

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) Commission Decision 2008/411/EC ([2]) harmonises the technical conditions for using the spectrum in the 3 400-3 800 MHz frequency band for the terrestrial provision of electronic communications services throughout the Union mainly targeting wireless broadband services for end-users.

(2) Decision No 243/2012/EU of the European Parliament and the Council ([3]) establishes a multiannual Radio Spectrum Policy Programme (RSPP) and sets the objective of promoting wider availability of wireless broadband services for the benefit of citizens and consumers in the Union. The RSPP requires Member States to foster the ongoing upgrade, by providers of electronic communications, of their networks to the latest, most efficient technology, in order to create their own dividends in line with the principles of service and technology neutrality.

(3) Article 6(2) of Decision No 243/2012/EU requires Member States to make available the 3 400-3 800 MHz frequency band under the terms and conditions of Decision 2008/411/EC and, subject to market demand, to authorise the use of this band by 31 December 2012 without prejudice to existing deployments of services and under conditions that allow consumers easy access to wireless broadband services.

(4) The 3 400-3 800 MHz frequency band offers significant potential for deploying dense and high-speed wireless broadband networks to provide innovative electronic communications services to end users. The use of this frequency band for wireless broadband should contribute to the economic and social policy objectives of the Digital Agenda for Europe.

(5) Pursuant to Article 4(2) of Decision No 676/2002/EC, the Commission gave a mandate on 23 March 2012 to the European Conference of Postal and Telecommunications Administrations (CEPT) to develop technical conditions for spectrum use in the 3 400-3 800 MHz frequency band with a view to accommodating developments in wireless broadband access technology, in particular large channel bandwidths, while ensuring efficient spectrum use.

([1]) OJ L 108, 24.4.2002, p. 1.
([2]) Commission Decision 2008/411/EC of 21 May 2008 on the harmonisation of the 3 400-3 800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community (OJ L 144, 4.6.2008, p. 77).
([3]) 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).

(6) In response to that mandate, on 8 November 2013 the CEPT issued a report (CEPT Report 49) on the technical conditions of spectrum harmonisation for terrestrial wireless systems in the 3 400-3 800 MHz frequency band. It includes the results of studies on the least restrictive technical conditions (such as block edge mask), frequency arrangements and principles for co-existence and coordination between wireless broadband and existing spectrum uses. The results on a block edge mask and the principles on coordination in CEPT Report 49 were developed on the basis of the Electronic Communications Committee (ECC) Report 203.

(7) The results of the Commission mandate to the CEPT should be applied across the Union and implemented by Member States without delay, given the rapidly growing market demand for high-speed wireless broadband services and the current low level of use of the 3 400-3 800 MHz frequency band for wireless broadband services.

(8) Spectrum users providing wireless broadband services would benefit from uniform technical conditions across the whole frequency range, which would ensure availability of equipment and coherent coordination between networks of different operators. To this end, a preferred channelling arrangement for the 3 400-3 600 MHz frequency band should be set out based on the results of CEPT Report 49, while observing the principle of technology and service neutrality.

(9) The legal framework for using the 3 400-3 800 MHz frequency band set by Decision 2008/411/EC should remain unchanged and thus ensure continued protection of other existing services within the band. In particular, fixed satellite systems (FSS) including earth stations would require continued protection through appropriate coordination between such systems and wireless broadband networks and services by national authorities on a case-by-case basis.

(10) Spectrum use by wireless broadband service providers and other existing services using the 3 400-3 800 MHz band, in particular FSS earth stations, would need to be coordinated based on guidance, best practices and the coordination principles set out in CEPT Report 49. These principles cover coordination processes, exchange of information, minimisation of reciprocal constraints and bilateral agreements for rapid cross border coordination, where terrestrial wireless broadband network base stations and FSS earth stations are located on the territories of different Member States.

(11) Given the frequency propagation characteristics of the 3 400-3 800 MHz frequency band and the harmonised technical conditions in place, the protection of existing uses would benefit from certain preferred configurations for the deployment of wireless broadband networks and services. These configurations include, but are not limited to, small cells, fixed wireless access, backhaul links in wireless broadband access networks or combinations thereof.

(12) While this Decision should be without prejudice to the protection and continued operation of other existing use in the bands, the new harmonised technical conditions should also apply, to the extent necessary, to existing spectrum usage rights in the 3 400-3 800 MHz frequency band so as to ensure technical compatibility between existing and new users of the band, efficient spectrum use and avoidance of harmful interference, including across borders between Union Member States.

(13) Cross-border agreements may be necessary to ensure the implementation by Member States of the parameters set by this Decision so as to avoid harmful interference and improve spectrum efficiency and convergence in spectrum use.

(14) The technical conditions of spectrum harmonisation for terrestrial wireless systems in the 3 400-3 800 MHz frequency band provided in CEPT Report 49 do not ensure compatibility with certain existing rights of use for such systems in this band in the Union. Therefore, existing spectrum users should be given appropriate time to apply the technical conditions of CEPT Report 49 without limiting access to spectrum in this band for users who comply with the technical conditions of CEPT Report 49 and national administrations the flexibility to defer the implementation of the technical conditions of this Decision depending on market demand.

(15) Decision 2008/411/EC should therefore be amended accordingly.

(16) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee,

HAS ADOPTED THIS DECISION:

Article 1

Decision 2008/411/EC is amended as follows:

(1) Article 2 is replaced by the following:

'*Article 2*

1. Without prejudice to the protection and continued operation of other existing use in this band, Member States shall designate and subsequently make available, on a non-exclusive basis the 3 400-3 800 MHz frequency band for terrestrial electronic communications networks, in compliance with the parameters set out in the Annex. Moreover, Member States need not apply the parameters laid down in the Annex in respect of rights of use for terrestrial electronic communications networks in the 3 400-3 800 MHz frequency band existing at the date of adoption of this decision, to the extent that the exercise of those rights does not prevent the use of that band according to the Annex.

2. Member States shall ensure that networks referred to in paragraph 1 give appropriate protection to systems in adjacent bands.

3. Member States shall not be bound to implement the obligations under this Decision in geographical areas where coordination with third countries requires a deviation from the parameters in the Annex.

Member States shall make all practicable efforts to solve such deviations, which they shall notify to the Commission, including the affected geographical areas, and publish the relevant information pursuant to Decision No 676/2002/EC.';

(2) In Article 3, the following subparagraph is added:

'Member States shall facilitate cross-border coordination agreements with the aim of enabling the operation of those networks, taking into account existing regulatory procedures and rights.';

(3) The following Article 4a is inserted:

'*Article 4a*

Member States shall apply the conditions laid down in the Annex on 30 June 2015 at the latest.

Member States shall report on the application of this Decision on 30 September 2015 at the latest.';

(4) The Annex is replaced by the text in the Annex to this Decision.

Article 2

This Decision is addressed to the Member States.

Done at Brussels, 2 May 2014.

For the Commission
Neelie KROES
Vice-President

ANNEX

'ANNEX

PARAMETERS REFERRED TO IN ARTICLE 2

A. GENERAL PARAMETERS

1. The preferred duplex mode of operation in the 3 400-3 600 MHz sub-band shall be Time Division Duplex (TDD).

2. Member States may alternatively implement Frequency Division Duplex (FDD) mode of operation in the 3 400-3 600 MHz sub-band for the purpose of:

   (a) ensuring greater efficiency of spectrum use, such as when sharing with existing rights of use during a co-existence period or implementing market-based spectrum management; or

   (b) protecting existing uses or avoiding interference; or

   (c) coordination with non-EU countries.

   Where the FDD mode of operation is implemented, the duplex spacing shall be 100 MHz with terminal station transmission (FDD uplink) located in the lower part of the band starting at 3 410 MHz and finishing at 3 490 MHz and base station transmission (FDD downlink) located in the upper part of the band starting at 3 510 MHz and finishing at 3 590 MHz.

3. The duplex mode of operation in the 3 600-3 800 MHz sub-band shall be Time Division Duplex.

4. The assigned block sizes 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 relevant sub-band edge ([1]). Depending on the duplex mode of operation the relevant sub-band edges are: 3 400 MHz and 3 600 MHz for TDD; 3 410 MHz and 3 510 MHz for FDD.

5. Base station and terminal station transmission within the 3 400-3 800 MHz band shall be in compliance with the Block Edge Mask in this Annex.

B. TECHNICAL CONDITIONS FOR BASE STATIONS — BLOCK EDGE MASK

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 operators of such networks, may also be used.

The BEM consists of several elements given in Table 1, both for the 3 400-3 600 MHz and the 3 600-3 800 MHz sub-band. The baseline power limit, designed to protect the spectrum of other operators, and the transitional region power limits, enabling filter roll-off from the in-block to the baseline power limit represent out-of-block elements. The guard bands apply only in the case of using FDD in the 3 400-3 600 MHz sub-band. The BEM is applicable to base stations with different power levels (typically referred to as macro, micro, pico and femto base stations ([2])).

Tables 2 to 6 contain the power limits for the different BEM elements. The in-block power limit is applied to a block owned by an operator. Power limits are provided also for guard bands and for the protection of radar operation below 3400 MHz.

The frequency ranges in Tables 1 to 6 depend on the duplex mode chosen for the 3 400-3 600 MHz sub-band (TDD or alternatively FDD). P_{Max} is the maximum carrier power for the base station in question, measured as EIRP ([3]). Synchronized operation means operation of TDD in two different networks where no simultaneous uplink and downlink transmissions occur, as defined in applicable standards.

([1]) If assigned blocks need to be offset to accommodate other existing users, a raster of 100 kHz must be used. Narrower blocks can be defined adjacent to other users, to allow efficient use of spectrum.

([2]) 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.

([3]) Equivalent Isotropic Radiated Power.

To obtain a BEM for a specific block, the BEM elements that are defined in Table 1 are combined in the following steps:

1. In-block power limit is used for the block assigned to the operator.

2. Transitional regions are determined, and corresponding power limits are used. The transitional regions may overlap with guard bands, in which case transitional region power limits are used.

3. For the remaining spectrum assigned to FDD or TDD, baseline power limits are used.

4. For the remaining guard band spectrum, guard band power limits are used.

5. For spectrum below 3 400 MHz, one of the additional baseline power limits is used.

The Figure provides an example of the combination of different BEM elements.

In the case of unsynchronized TDD networks, the compliance of two adjacent operators with the BEM requirements could be achieved by introducing frequency separation (e.g. through the authorisation process at national level) between the block edges of both operators. As another option, the so-called restricted blocks may be introduced for two adjacent operators which would require them to limit the power level used in the upper- or lowermost portions of their assigned spectrum blocks ([1]).

Table 1

Definition of BEM elements

BEM element	Definition
In-block	Refers to a block for which the BEM is derived.
Baseline	Spectrum used for TDD, FDD uplink or FDD downlink, with the exception of the block assigned to the operator and the corresponding transitional regions.
Transitional region	For FDD downlink blocks, the transitional region applies 0 to 10 MHz below and 0 to 10 MHz above the block assigned to the operator. For TDD blocks, the transitional region applies 0 to 10 MHz below and 0 to 10 MHz above the block assigned to the operator. The transitional region applies to adjacent TDD blocks assigned to other operators if networks are synchronised, or to spectrum in-between adjacent TDD blocks that are separated by 5 or 10 MHz. Transitional regions do not apply to adjacent TDD blocks assigned to other operators, if networks are not synchronised. The transitional region does not apply below 3 400 MHz or above 3 800 MHz.
Guard bands	The following guard bands apply in case of an FDD allocation: 3 400-3 410, 3 490-3 510 (duplex gap) and 3 590-3 600 MHz In case of overlap between transitional regions and guard bands, transitional power limits are used.
Additional baseline	Spectrum below 3 400 MHz.

Table 2

In-block power limit

BEM element	Frequency range	Power limit
In-block	Block assigned to the operator	Not obligatory. In case an upper bound is desired by an administration, a value must be applied which does not exceed 68 dBm/5 MHz per antenna.

([1]) A recommended value for such limited power level is 4 dBm/5 MHz EIRP per cell applied to the upper- or lowermost 5 MHz of an operator's assigned spectrum block.

Explanatory note to Table 2

For femto base stations, power control should be applied to minimize interference to adjacent channels. The requirement on power control for femto base stations results from the need to reduce interference from equipment that may be deployed by consumers and may thus not be coordinated with surrounding networks.

Table 3

Baseline power limits

BEM element	Frequency range	Power limit
Baseline	FDD downlink (3 510-3 590 MHz). Synchronized TDD blocks (3 400-3 800 MHz or 3 600-3 800 MHz).	Min(P_{Max} — 43,13) dBm/5 MHz EIRP per antenna
Baseline	FDD uplink (3 410-3 490 MHz). Unsynchronised TDD blocks (3 400-3 800 MHz or 3 600-3 800 MHz).	– 34 dBm/5 MHz EIRP per cell (*)

(*) An exception for this baseline can be negotiated between adjacent operators for femto base stations in the case when there is no risk for interference to macro base stations. In that case – 25 dBm/5MHz EIRP per cell may be used.

Explanatory note to Table 3

The baseline for FDD downlink and synchronised TDD is expressed by combining attenuation relative to the maximum carrier power with a fixed upper limit. The stricter of the two requirements applies. The fixed level provides an upper bound on the interference from a base station. When two TDD blocks are synchronized, there will be no interference between base stations. In this case, the same baseline as for the FDD downlink region is used.

The baseline power limit for FDD uplink and unsynchronised TDD is expressed as a fixed limit only.

Table 4

Transitional region power limits

BEM element	Frequency range	Power limit
Transitional region	– 5 to 0 MHz offset from lower block edge or 0 to 5 MHz offset from upper block edge	Min(P_{Max} — 40,21) dBm/5 MHz EIRP per antenna
Transitional region	– 10 to – 5 MHz offset from lower block edge or 5 to 10 MHz offset from upper block edge	Min(P_{Max} — 43,15) dBm/5 MHz EIRP per antenna

Explanatory note to Table 4

The transitional region power limits are defined to enable the reduction of power from the in-block level to the baseline or guard band levels. The requirements are expressed as attenuation relative to the maximum carrier power, combined with a fixed upper limit. The stricter of the two requirements applies.

Table 5

Guard band power limits for FDD

BEM element	Frequency range	Power limit
Guard band	3 400-3 410 MHz	– 34 dBm/5 MHz EIRP per cell
Guard band	3 490-3 500 MHz	– 23 dBm/5 MHz per antenna port
Guard band	3 500-3 510 MHz	Min(P_{Max} — 43,13) dBm/5 MHz EIRP per antenna
Guard band	3 590-3 600 MHz	Min(P_{Max} — 43,13) dBm/5 MHz EIRP per antenna

Explanatory note to Table 5

For the guard band 3 400-3 410 MHz, the power limit is chosen to be the same as the baseline in the adjacent FDD uplink (3 410-3 490 MHz). For the guard bands 3 500-3 510 MHz and 3 590-3 600 MHz, the power limit is chosen to be the same as the baseline in the adjacent FDD downlink (3 510-3 590 MHz). For the guard band 3 490-3 500 MHz, the power limit is based on the spurious emission requirement of – 30 dBm/MHz at the antenna port converted to 5 MHz bandwidth.

Table 6

Base station additional baseline power limits for country specific cases

Case		BEM element	Frequency range	Power limit
A	Union countries with military radiolocation systems below 3 400 MHz	Additional Baseline	Below 3 400 MHz for both TDD and FDD designation (*)	– 59 dBm/MHz EIRP (**)
B	Union countries with military radiolocation systems below 3 400 MHz	Additional Baseline	Below 3 400 MHz for both TDD and FDD designation (*)	– 50 dBm/MHz EIRP (**)
C	Union countries without adjacent band usage or with usage that does not need extra protection	Additional Baseline	Below 3 400 MHz for both TDD and FDD designation	Not applicable

(*) Administrations may choose to have a guard band below 3 400 MHz. In that case the power limit may apply below the guard band only.

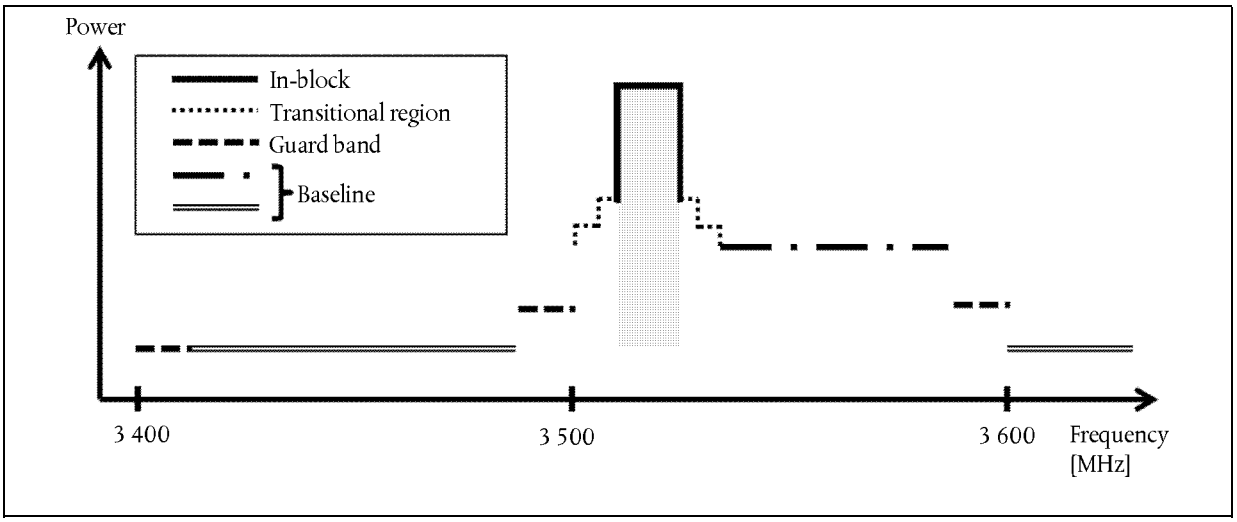
(**) Administrations may select the limit from case A or B depending on the level of protection required for the radar in the region in question.

Explanatory note to Table 6

The additional baseline power limits reflect the need for protection for military radiolocation in some countries. Cases A, B and C can be applied per region or country so that the adjacent band may have different levels of protection in different geographical areas or countries, depending on the deployment of the adjacent band systems. Other mitigation measures like geographical separation, coordination on a case-by-case basis or an additional guard band may be necessary for a TDD mode of operation. The additional baseline power limits given in Table 6 are applicable only to outdoor cells. In the case of an indoor cell, the power limits can be relaxed on a case by case basis. For terminal stations, other mitigation measures may be necessary such as geographical separation or an additional guard band for both the FDD and TDD mode of operation.

Figure

Example for combining BEM elements for base stations for an FDD block starting at 3 510 MHz (*)



(*) Note in particular that different baseline levels are defined for different parts of the spectrum and that the power limit of the lower transitional region is used in a part of the guard band 3 490–3 510 MHz. Spectrum below 3 400 MHz has not been included in the Figure, although the BEM element "additional baseline" may be applied to protect military radiolocation.

C. TECHNICAL CONDITIONS FOR TERMINAL STATIONS

Table 7

In-block requirement — terminal station BEM in-block power limit

Maximum in-block power (*)	25 dBm

(*) This power limit is specified as EIRP for terminal stations designed to be fixed or installed and as total radiated power (TRP) for terminal stations designed to be mobile or nomadic. EIRP and TRP are equivalent for isotropic antennas. It is recognised that this value may be subject to a tolerance (of up to 2 dB) defined in the harmonised standards to take account of operation under extreme environmental conditions and production spread.

Member States may relax the limit set out in Table 7 under certain circumstances, for example fixed terminal stations, provided that protection and continued operation of other existing use in the 3 400-3 800 MHz band is not compromised and cross-border obligations are fulfilled.'