COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 17.1.2005
C(2005)34 final

COMMISSION DECISION

of

on the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the Community

(Text with EEA relevance)

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THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

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) The Commission Communication to the Council and the European Parliament of 2 June 2003 on "European Road Safety Action Programme – Halving the number of road accident victims in the European Union by 2010: a shared responsibility"[2] sets out a coherent approach to road safety in the European Union. Furthermore, in its Communication to the Council and the European Parliament of 15 September 2003, entitled "Information and Communications technologies for safe and intelligent vehicles"[3], the Commission announced its intention to improve road safety in Europe, to be known as the *eSafety* initiative, by using new information and communications technologies and intelligent road safety systems, such as automotive short-range radar equipment. On 5 December 2003 in its Conclusions on road safety[4] the Council also called for the improvement of vehicle safety by the promotion of new technologies such as electronic safety.

(2) The rapid and coordinated development and deployment of automotive short-range radar within the Community require a harmonised radio frequency band to be available for this application in the Community without delay and on a stable basis, in order to provide the necessary confidence to industry to make the necessary investments.

(3) On 5 August 2003, with a view to such harmonisation, the Commission issued a mandate, pursuant to Article 4(2) of Decision 676/2002/EC, to the European Conference of Postal and Telecommunications Administrations (CEPT), to harmonise

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1 OJ L 108, 24.4.2002, p.1.
2 COM(2003) 311.
3 COM(2003) 542.
4 Conclusions of the Council of the European Union on road safety, 15058/03 TRANS 307.

radio spectrum and to facilitate a coordinated introduction of automotive short-range radar.

(4) As a result of that mandate, the 79 GHz range band has been identified by CEPT as the most suitable band for long term development and deployment of automotive short-range radar, with the introduction of this measure by January 2005 at the latest. The Commission therefore adopted Decision 2004/545/EC of 8 July 2004 on the harmonisation of radio spectrum in the 79 GHz range for the use of automotive short-range radar equipment in the Community[5].

(5) However, automotive short-range radar technology in the 79 GHz range band is still under development and is not immediately available on a cost-effective basis, although it is understood that the industry will promote the development of such a technology in order to make it available at the earliest possible date.

(6) In its report of 9 July 2004 to the European Commission under the mandate of 5 August 2003, the CEPT identified the 24 GHz range radio spectrum band as being a temporary solution which would enable the early introduction of automotive short-range radar in the Community to meet the objectives of the *e-Safety* initiative, since technology is considered sufficiently mature for operation in that band. Therefore, Member States should take the appropriate measures based on their particular national radio spectrum situation to make sufficient radio spectrum available on a harmonised basis in the 24 GHz range radio spectrum band (21.65-26.65 GHz), while protecting existing services operating in that band from harmful interference.

(7) According to Footnote 5.340 of the Radio Regulations of the ITU, all emissions are prohibited in the band 23.6-24.0 GHz, in order to protect the use on a primary basis of this band by the radio astronomy, earth exploration satellite and space research passive services. This prohibition is justified by the fact that harmful interference to these services by emissions in the band cannot be tolerated.

(8) Footnote 5.340 is subject to national implementation and may be applied in conjunction with Article 4.4. of the Radio Regulations, pursuant to which no frequency may be assigned to a station in derogation of the Radio Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to a station operating in accordance with the provision of the ITU rules. Therefore, in its report to the Commission, CEPT pointed out that Footnote 5.340 does not strictly prevent administrations from the use of bands falling under the Footnote, provided that they are neither impacting services of other administrations nor trying to have international recognition under the ITU of such use.

(9) The 23.6-24.0 GHz frequency band is of primary interest for the scientific and meteorological communities to measure water vapour content essential for temperature measurements for the earth exploration satellite service. In particular, this frequency plays an important role in the Global Monitoring for Environment and Security initiative (GMES) aiming at an operational European warning system. The 22.21-24.00 GHz frequency range is also needed to measure spectral lines of ammonia and water as well as continuum observations for the radio astronomy service.

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[5] OJ L 241, 13.7.2004, p.66.

(10) The bands 21.2-23.6 GHz and 24.5-26.5 GHz are allocated to the fixed service on a primary basis in the ITU Radio Regulations and are extensively used by fixed links to meet the infrastructure requirement for existing 2G and 3G mobile networks and to develop broadband fixed wireless networks.

(11) Based on studies of compatibility between automotive short-range radar and fixed services, earth exploration satellite services and radio astronomy services, CEPT has concluded that an unlimited deployment of automotive short-range radar systems in the 24 GHz range radio spectrum band will create unacceptable harmful interference to existing radio applications operating in this band. Considering ITU Radio Regulations and the importance of these services, any introduction of automotive short-range radar at 24 GHz could be made only on condition that these services in the band are sufficiently protected. In this respect, while the signal emanating from automotive short-range radar equipment is extremely low in most of the 24 GHz frequency range, it is important to take into account the cumulative effect of the use of many devices, which individually might not cause harmful interference.

(12) According to CEPT, existing applications operating in or around the 24 GHz band would increasingly suffer significant levels of harmful interference if a certain level of penetration of vehicles using the 24 GHz range radio spectrum band for automotive short-range radars were to be exceeded. The CEPT concluded in particular that sharing between earth exploration satellite services and automotive short-range radar could only be feasible on a temporary basis if the percentage of vehicles equipped with 24 GHz automotive short-range radar was limited to 7.0% in each national market. While this percentage has been calculated on the basis of earth exploration satellite pixels, national markets are used as the reference against which to calculate the threshold, as this represents the most effective means of carrying out this monitoring.

(13) Furthermore, the CEPT report concluded that to maintain the protection requirements of the fixed service, sharing with automotive short-range radar could only be feasible on a temporary basis if the percentage of vehicles equipped with automotive short-range radar within sight of a fixed service receiver was limited to less than 10%.

(14) It is therefore presumed on the basis of the work carried out by the CEPT that harmful interference should not be caused to other users of the band where the total number of vehicles registered, placed on the market or put into service equipped with 24 GHz automotive short-range radar does not exceed the level of 7% of the total number of vehicles in circulation in each Member State.

(15) It is not presently anticipated that this threshold will be reached before the Reference Date of 30 June 2013.

(16) Several Member States also use the 24 GHz range radio spectrum band for radar speed meter control which contributes to traffic safety. Following compatibility studies with automotive short range radar of a number of these devices operating in Europe, CEPT has concluded that compatibility is possible under certain conditions, principally by decoupling the centre frequencies of the two systems by at least 25 MHz, and that the risk of harmful interference is low and will not create false speed measurements. Manufacturers of vehicles using automotive short-range radar systems have also committed themselves to continue taking appropriate steps to ensure that the risk of interference to radar speed meters is minimal. The reliability of radar speed meter

equipment will therefore not be affected by the operation of automotive short range radar to any significant extent.

(17) Some Member States will in the future use the band 21.4 – 22.0 GHz for Broadcast Satellite Service in the direction space-to-earth. Following compatibility studies, relevant national administrations have concluded that no compatibility problems exists if the emissions of automotive short-range radar are limited to no more than - 61.3 dBm/MHz for frequencies below 22 GHz.

(18) The above presumptions and precautions need to be kept under on-going objective and proportionate review by the Commission assisted by the Member States, in order to assess on the basis of concrete evidence whether the threshold of 7% will be breached in any national market before the Reference Date, whether harmful interference has been or is likely to be caused within a short period of time to other users of the band by the breach of the threshold of 7% in any national market, or whether harmful interference has been caused to other users of the band even below the threshold.

(19) Therefore, as a result of information that becomes available as part of the review process, modifications to the present Decision may turn out to be necessary, in particular to ensure that there is no harmful interference caused to other users of the band.

(20) Accordingly, there can be no expectation that the band of 24 GHz will continue to be available for automotive short-range radar until the Reference Date, if any of the above-mentioned presumptions prove not to be valid at any time.

(21) In order to facilitate and render more effective the monitoring of the use of the 24 GHz band and the review process, Member States may decide to draw more directly upon manufacturers and importers for information required in relation to the review process.

(22) As reported by CEPT, sharing between automotive short-range radar and the radio astronomy service within the 22.21-24.00 GHz band could lead to harmful interference for the latter if short-range radar-equipped vehicles were allowed to operate unhindered within a certain distance from each radio astronomy station. Therefore, and bearing in mind that Directive 1999/5/EC requires that radio equipment must be constructed so as to avoid harmful interference, automotive short-range radar systems operating in bands used by radio astronomy in the 22.21-24.00 GHz range should be deactivated when moving within these areas. The relevant radio astronomy stations and their associated exclusion zones should be defined and justified by national administrations.

(23) In order to be effective and reliable, such deactivation is best done automatically. However, to allow an early implementation of automotive short-range radar in 24 GHz, a limited amount of transmitters with manual deactivation can be allowed as, with such a limited deployment, the probability of causing harmful interference to the radio astronomy service is expected to remain low.

(24) The temporary introduction of automotive short-range radar in the 24 GHz range radio spectrum band has an exceptional character and must not be considered as a precedent for possible introduction of other applications in the bands where ITU Radio Regulations Footnote 5.340 applies, be it for temporary or permanent use. Moreover, automotive short-range radar must not be considered as a safety-of-life service within

the meaning of the ITU Radio Regulations and must operate on a non-interference and non-protected basis. Furthermore, automotive short-range radar should not constrain the future development in the use of the 24 GHz band of applications which are protected by Footnote 5.340.

(25) The placing on the market and operation of 24 GHz automotive short-range radar equipment in a stand-alone mode or retrofitted in vehicles already on the market would not be compatible with the objective of avoiding harmful interference to existing radio applications operating in this band, since it could lead to an uncontrolled proliferation of such equipment. In contrast, it should be easier to control the use of automotive short-range radar systems in the 24 GHz band solely as part of a complex integration of the electrical harness, automotive design and software package of a vehicle and originally installed in the new vehicle, or as replacement of original vehicle-mounted automotive short-range radar equipment.

(26) This Decision will apply taking into account and without prejudice to Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers[6] and to Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity[7].

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

HAS ADOPTED THIS DECISION:

Article 1

The purpose of this Decision is to harmonise the conditions for the availability and efficient use of the 24 GHz range radio spectrum band for automotive short-range radar equipment.

Article 2

For the purposes of this Decision, the following definitions shall apply:

(1) ‘24 GHz range radio spectrum band’ means the 24.15 +/- 2.50 GHz frequency band;

(2) ‘automotive short-range radar equipment’ means equipment providing road vehicle-based radar functions for collision mitigation and traffic safety applications;

(3) ‘automotive short-range radar equipment put into service in the Community’ means automotive short-range radar equipment originally installed or replacing one so installed in a vehicle which will be or which has been registered, placed on the market or put into service in the Community;

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[6] OJ L 42, 23.2.1970, p.1.
[7] OJ L 91, 7.4.1999, p.10.

(4) ‘on non-interference and non-protected basis’ means that no harmful interference may be caused to other users of the band and that no claim may be made for protection from harmful interference received from other systems or services operating in that band;

(5) ‘Reference Date’ means 30 June 2013;

(6) ‘Transition Date’ means 30 June 2007;

(7) ‘vehicle’ means any vehicle as defined by Article 2 of Directive 70/156/EEC;

(8) deactivation’ means the termination of emissions by automotive short-range radar equipment;

(9) ‘exclusion zone’ means the area around a radio astronomy station defined by a radius equivalent to a specific distance from the station;

(10) ‘duty cycle’ means the ratio of time during any one hour period when equipment is actively transmitting.

Article 3

The 24 GHz range radio spectrum band shall be designated and made available as soon as possible and no later than 1 July 2005, on a non-interference and non-protected basis, for automotive short-range radar equipment put into service in the Community which complies with the conditions laid down in Article 4 and Article 6.

The 24 GHz range radio spectrum band shall remain so available until the Reference Date, subject to the provisions of Article 5.

After that date, the 24 GHz range radio spectrum band shall cease to be available for automotive short-range radar equipment mounted on any vehicle except where that equipment was originally installed, or is replacing equipment so installed, in a vehicle registered, placed on the market or put into service before that date in the Community.

Article 4

The 24 GHz range radio spectrum band shall be available for the ultra-wide band part of automotive short-range radar equipment with a maximum mean power density of -41.3 dBm/MHz effective isotropic radiated power (e.i.r.p.) and peak power density of 0 dBm/50MHz e.i.r.p., except for frequencies below 22 GHz, where the maximum mean power density shall be limited to -61.3 dBm/MHz e.i.r.p.

The 24.05-24.25 GHz radio spectrum band is designated for the narrow-band emission mode/component, which may consist of an unmodulated carrier, with a maximum peak power of 20 dBm e.i.r.p and a duty cycle limited to 10% for peak emissions higher than -10 dBm e.i.r.p.

Emissions within the 23.6-24.0 GHz band that appear 30° or greater above the horizontal plane shall be attenuated by at least 25 dB for automotive short-range radar equipment placed on the market before 2010 and thereafter by at least 30 dB.

Article 5

1. The continued availability of the 24 GHz range radio spectrum band for automotive short-range radar applications shall be kept under active scrutiny to ensure that the main premise of opening this band to such systems remains valid, which is that no harmful interference is caused to other users of the band, in particular through the timely verification of:

(a) the total number of vehicles registered, placed on the market or put into service equipped with 24 GHz automotive short-range radar in each Member State, to verify that this number does not exceed the level of 7% of the total number of vehicles in circulation in each Member State;

(b) whether adequate information has been made available by Member States or by manufacturers and importers regarding the number of 24 GHz short-range radar-equipped vehicles for the purpose of monitoring effectively the use of the 24 GHz band by automotive short-range radar equipment;

(c) whether the individual or cumulative use of 24 GHz automotive short-range radar is causing or is likely to cause within a short period of time harmful interference to other users in the 24 GHz band or in adjacent bands in at least one Member State, whether or not the threshold referred to in (a) has been reached;

(d) the continuing appropriateness of the Reference Date.

2. In addition to the review process in paragraph 1, a Fundamental Review shall be carried out by 31 December 2009 at the latest to verify the continuing relevance of the initial assumptions concerning the operation of automotive short-range radar in the 24 GHz range radio spectrum band, as well as to verify whether the development of automotive short-range radar technology in the 79 GHz range is progressing in such a way as to ensure that automotive short-range radar applications operating in this radio spectrum band will be readily available by 1 July 2013.

3. The Fundamental Review may be triggered by a reasoned request by a Member of the Radio Spectrum Committee, or at the Commission's own initiative.

4. The Member States shall assist the Commission to carry out the reviews referred to in paragraphs 1 and 2 by ensuring that the necessary information is collected and provided to the Commission in a timely manner, in particular the information set out in the Annex.

Article 6

1. Automotive short-range radar equipment mounted on vehicles shall only operate when the vehicle is active.

2. Automotive short-range radar equipment put into service in the Community shall ensure protection of the radio astronomy stations operating in the radio spectrum band 22.21-24.00 GHz defined in Article 7 through automatic deactivation in a defined exclusion zone or via another method providing equivalent protection for these stations without driver intervention.

3. By way of derogation to paragraph 2, manual deactivation will be accepted for automotive short-range radar equipment put into service in the Community operating in the 24 GHz range radio spectrum band before the Transition Date.

Article 7

Each Member State shall determine the relevant national radio astronomy stations to be protected pursuant to Article 6(2) in its territory and the characteristics of the exclusion zones pertaining to each station. This information, supported by appropriate justification, shall be notified to the Commission within six months after adoption of this Decision, and published in the Official Journal of the European Union.

Article 8

This Decision is addressed to the Member States.

Done at Brussels, […]

For the Commission
Member of the Commission

ANNEX

Information required for monitoring the use of the 24 GHz range radio spectrum band by automotive short-range radar

This Annex establishes the data required to verify the penetration rate of automotive vehicles equipped with short-range radar in each Member State of the European Union in accordance with Article 5. This data shall be used to calculate the proportion of vehicles equipped with short-range radar using the 24 GHz range radio spectrum compared to the total number of vehicles in circulation in each Member State.

The following data shall be collected on a yearly basis:

(1) The number of vehicles equipped with short-range radar using the 24 GHz range radio spectrum band produced and/or placed on the market and/or registered for the first time during the reference year in the Community;

(2) The number of vehicles equipped with short-range radar using the 24 GHz range radio spectrum band imported from outside the Community during the reference year;

(3) The total number of vehicles in circulation during the reference year.

All data shall be accompanied by an evaluation on the uncertainty related to the information.

In addition to the above data, any other relevant information which would assist the Commission in maintaining an adequate overview on the continued use of the 24 GHz range radio spectrum band by automotive short-range radar devices shall be made available in a timely fashion, including information on:

- current and future market trends, both within and outside the Community;
- after-market sales and retrofitting of equipment;
- the state of progress of alternative technologies and applications, notably automotive short-range radar operating in the 79 GHz range radio spectrum band according to Decision 2004/545/EC.