



# ECC Decision (08)05

The harmonisation of frequency bands for the implementation of digital Public Protection and Disaster Relief (PPDR) narrow band and wide band radio applications in bands within the 380-470 MHz range

**Approved 27 June 2008**

**Amended 8 March 2019**

## EXPLANATORY MEMORANDUM

### 1 INTRODUCTION

This ECC Decision addresses the harmonisation of bands within the frequency range 380-470 MHz for the implementation of digital Public Protection and Disaster Relief (PPDR) narrow band and wide band radio applications in the mobile service (land mobile service).

The Resolution 646 (Rev. WRC-15) [1] defines the purpose of a PPDR radio system. Such a system includes two different uses. The first one is for Public Protection (PP) which covers radiocommunications used by responsible agencies and organisations dealing with maintenance of law and order, protection of life and property, and emergency situations. The second one is for Disaster Relief (DR) which covers radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant, widespread threat to human life, health, property or the environment, whether caused by accident, nature or human activity, and whether developing suddenly or as a result of complex, long-term processes.

To provide PPDR narrow band applications, the trend is to implement wide area networks including digital trunked radio networks providing digital voice and low speed data applications (e.g. pre-defined status messages, data transmissions of forms and messages, access to databases). Report ITU-R M.2014 [2] lists a number of technologies, with typical channel bandwidths up to 25 kHz, which are currently used to deliver narrow band PPDR applications.

Wide band technologies are able to carry data rates in the range of 384-500 kbit/s. Various systems for wide band applications to support PPDR were standardised. Many of these are referenced in Report ITU-R M.2014 [2] and in Recommendation ITU-R M.1073 [3] and Recommendation ITU-R M.1457 [4] and with channel bandwidths dependent on the use of spectrally efficient technologies. A wide band wireless system may be able to reduce response times of accessing the Internet and other information databases directly from the scene of an incident or emergency.

It has to be noted that a third class of PPDR applications is under development. Broadband technology could be seen as a natural evolutionary trend from wide band. Broadband applications enable an entirely new level of functionality with additional capacity to support higher speed data and higher resolution images. Nevertheless, this last class of PPDR applications is covered by ECC Decision (16)02 on harmonised technical conditions and frequency bands for the implementation of Broadband Public Protection and Disaster Relief (BB-PPDR) systems [5].

### 2 BACKGROUND

This ECC Decision covers narrow band as well as wide band PPDR radio applications. Spectrum within the duplex bands 380-385 MHz/390-395 MHz, already identified by the former ERC Decision (96)01 [9] which was withdrawn in 2008, should be designated for narrow band PPDR radio applications.

New standards for wide band PPDR radio applications have been developed in various standards organisations. In Europe the ETSI standard TETRA, with its TETRA Enhanced Data Service (TEDS) according to EN 302 561 [6], is expected to be used to provide wide band data applications for Public Protection as well as Disaster Relief radiocommunications. TEDS standard supports radio channel widths 25 kHz, 50 kHz, 100 kHz and 150 kHz and allows user bit rates between 30 and 400 kbit/s depending on which bandwidth is being chosen and on the distance from the base station site.

The provisions of this ECC Decision regarding the wide band systems are based on a “tuning range” concept which provides flexibility for the administrations by implementing this Decision. The aim is to make radio spectrum available for wide band PPDR radio applications either in the 385-390 MHz/395-399.9 MHz band, in the 410-420 MHz/420-430 MHz band or in the 450-460 MHz/460-470 MHz band. Further information regarding spectrum requirements can be found in ECC Report 102 [7]. It is advantageous to identify the band 380-470 MHz as a tuning range for wide band PPDR within Europe. Within this tuning range the most

suitable sub-band is 380-430 MHz. The duplex band 380-385 MHz / 390-395 MHz, which has been identified for narrow band PPDR radio applications (emergency services) since 1996, will consequently be available for those wide band radio applications.

It has been decided to implement narrow band as well as wide band PPDR radio applications in one single ECC Decision because wide band systems supplement narrow band systems and therefore both systems have to be considered together, also from a regulatory point of view.

ECC Decision (19)02 [8] addresses the availability of frequency bands for the introduction of land mobile systems in the frequency ranges 68-87.5 MHz, 146-174 MHz, 406.1-410 MHz, 410-430 MHz, 440-450 MHz and 450-470 MHz.

This ECC Decision has been developed in order to provide confidence to industry and potential users that the necessary frequency spectrum to meet the digital requirements will be provided in CEPT countries in accordance with the market developments. This Decision covers the PPDR systems for which the compatibility and sharing studies are referenced in Annex 1 to this Decision and which are using different channel bandwidths.

In line with the development of narrow band PPDR, the need for high-speed data and other additional services increases (see ECC Report 199 [10], Report ITU-R M.2291 [11] and Report ITU-R M.2377 [12]). There is an identified requirement for services that cannot be delivered over traditional narrow band technology. This leads to the introduction of wide band and broadband systems.

### **3 REQUIREMENT FOR AN ECC DECISION**

The allocation or designation of frequency bands for use by a service or a radio application under specified conditions in CEPT administrations is laid down by law, regulation or administration action. It is considered necessary to designate and implement frequency bands for digital Public Protection and Disaster Relief (PPDR) radio applications. Those radio applications may be based on narrow band or wide band systems. The harmonisation on a European basis would support the aims of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment [13] and repealing Directive 1999/5/EC. A commitment by CEPT administrations to implement an ECC Decision will provide a clear indication that the required frequency bands will be made available on time.

**ECC DECISION OF 27 JUNE 2008 ON THE HARMONISATION OF FREQUENCY BANDS FOR THE IMPLEMENTATION OF DIGITAL PUBLIC PROTECTION AND DISASTER RELIEF (PPDR) NARROW BAND AND WIDE BAND RADIO APPLICATIONS IN BANDS WITHIN THE 380-470 MHz FREQUENCY RANGE (ECC/DEC/(08)05) AMENDED 17 JUNE 2016 AND AMENDED 8 MARCH 2019**

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that there is a need to identify spectrum for the implementation of Public Protection and Disaster Relief (PPDR) radio applications in the mobile service in Europe;
- b) that in CEPT countries there are agreements between the military and the civil authorities to accommodate the emergency services in the frequency bands 380-385 / 390-395 MHz subject to certain conditions such as sharing;
- c) that in many CEPT countries the frequency bands 380-385 / 390-395 MHz are already used by narrow band emergency systems;
- d) the identification of the 380-385 MHz / 390-395 MHz band for narrow band digital PPDR does not preclude the use of other frequencies for narrow band and wide band digital public protection and disaster relief in the frequency range 380-430 MHz on a national basis;
- e) that wide band digital PPDR radio applications provide higher data rates and supplement the features of narrow band PPDR radio applications (digital land mobile systems for the emergency services);
- f) that ECC Report 102 on "Public Protection and Disaster Relief spectrum requirements" (January 2007) [7] provides information regarding the demand for wide band radio applications;
- g) that this ECC Report 102, approved in 2007, recognised that the sub-band 380-430 MHz is the most suitable, but identified the full band 380-470 MHz for wide band PPDR to provide flexibility;
- h) that Report ITU-R M.2377 on "Radiocommunication objectives and requirements for public protection and disaster relief" (2015) [12] defines the public protection and disaster relief (PPDR) objectives and requirements for the implementation of future advanced solutions;
- i) that Resolution 646 (Rev. WRC-15) on "Public Protection and Disaster Relief" [1] strongly recommends to use regionally harmonised bands for PPDR radio applications;
- j) that the frequency bands 406.1-410 MHz, 410-430 MHz, 440-450 MHz and 450-470 MHz within the tuning range 380-470 MHz have been designated to land mobile systems (analogue and digital) using different channel bandwidths by ECC Decision (19)02 [8];
- k) that in the European table of frequency allocations and utilisations covering the frequency range 8.3 kHz to 3000 GHz (ERC Report 25, revised in May 2016 [14]) the frequency bands 380-399.9 MHz, 410-430 MHz and 450-470 MHz are allocated to the mobile service on a primary basis, however the frequency range 225-399.9 MHz has also been identified for military applications;
- l) that narrow band as well as wide band digital PPDR radio applications are expected to be large area or nation-wide networks to be used on a permanent basis;
- m) that parts of the bands identified in this Decision are allocated to radio services other than the mobile service and the usage of these bands may be subject to agreements between neighbouring countries in accordance with the ITU Radio Regulations;
- n) that WRC-07 has identified the band 450-470 MHz for use by administrations wishing to implement International Mobile Telecommunications (IMT) noting that this identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations;

- o) that there is a need for interoperability between PPDR radio applications, both nationally and for cross-border operations;
- p) that Recommendation T/R 25-08 [15] provides recommended channelling arrangements including duplex spacing;
- q) that bilateral or multilateral arrangements may be necessary for the coordination of frequencies for PPDR in the border areas and this may have an influence on the availability of radio spectrum;
- r) that administrations have the right to decide which of the digital land mobile systems contained in Annex 1 to this Decision can be introduced for narrow band or wide band PPDR radio applications in their national territories, with due respect to their international trade obligations and to European Community legislation as far as EU Member States are concerned;
- s) that ECC Decision (16)02 [5] provides harmonised technical conditions and frequency bands for the implementation of Broadband Public Protection and Disaster Relief (BB-PPDR) systems in the 400 MHz and 700 MHz frequency ranges;
- t) that Recommendation ITU-R M.1637 [22] provides information and recommendations on the global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations;
- u) that the World Radiocommunication Conference (Geneva, 2015), has revised Resolution 647 (Rev.WRC-15) [23] which considers that administrations are urged to take all practical steps to facilitate the rapid deployment and effective use of telecommunication resources for early warning, emergency, disaster mitigation and relief operations by reducing and, where possible, removing regulatory barriers and strengthening global, regional, and trans-border cooperation between States;
- v) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the RE Directive. Conformity with the essential requirements of the RE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the RE Directive.

### *DECIDES*

1. that the **purpose of this Decision** is to identify the frequency bands for digital Public Protection and Disaster Relief (PPDR) narrow band and wide band radio applications in the 380-470 MHz band using tuning ranges where necessary and to establish a common framework for the implementation of PPDR;
2. that this Decision for PPDR covers narrow and wide band digital land mobile systems listed in the Annex 1;
3. that sufficient amount of spectrum **shall be made available**
  - a) for narrow band digital PPDR radio applications using channel bandwidth up to 25 kHz within the duplex bands 380-385 MHz / 390-395 MHz that had been designated for use by emergency services;  
and/or
  - b) for wide band digital PPDR radio applications using channel bandwidth of 25 kHz or more within available parts of the frequency range 380-470 MHz, preferably in 380-430 MHz;
4. that additional systems can be added in Annex 1 to this Decision after respective sharing and compatibility studies have been conducted;
5. that CEPT administrations shall exempt from individual licensing and allow the free circulation and use of terminals of narrow band and wide band digital PPDR systems operating under the control of a network within the band identified in Decides 1 of this Decision;
6. that this Decision **enters into force** on 17<sup>th</sup> June 2016;
7. that the preferred **date for implementation** of this Decision shall be 17<sup>th</sup> December 2016;

8. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.”

*Note:*

*Please check the Office documentation database <https://www.ecodocdb.dk> for the up to date position on the implementation of this and other ECC Decisions.*

## **ANNEX 1: LIST OF DIGITAL LAND MOBILE SYSTEMS AND RELATED SHARING AND COMPATIBILITY REPORTS**

### **A1.1 WIDE BAND DIGITAL LAND MOBILE SYSTEMS**

#### **A1.1.1 200 kHz systems**

ECC Report 22 [16] on "The technical impact of introducing TAPS on 12.5/25 kHz PMR/PAMR technologies in 380-400 MHz, 410-430 MHz and 450-470 MHz bands";

Harmonised standards: EN 301 502 [17] and EN 301 511 [18].

Note that the TETRA TAPS technology was never implemented. However, equivalent 200 kHz systems encompass GSM technology and potentially also LTE machine-type-communications in the future.

#### **A1.1.2 CDMA-PAMR and other equivalent 1.25 MHz systems**

ECC Report 39 [19] on the "Technical impact of introducing CDMA-PAMR on 12.5 /25 kHz PMR/PAMR technologies in the 410-430 MHz and 450-470 MHz bands" investigates adjacent band compatibility between CDMA-PAMR and narrow band PMR/PAMR in the 400 MHz bands;

Harmonised standards: EN 302 426, EN 301 449 and EN 301 526.

Note that EN 302 426, EN 301 449 and EN 301 526 will most likely be made historical (or be withdrawn) by ETSI when Directive 1999/05/EC (R&TTE-D) ceases to be applicable.

#### **A1.1.3 TETRA TEDS and other equivalent systems**

ECC Report 99 [20] on "TETRA Enhanced Data Services (TEDS): Impact on existing PMR/PAMR and Air Ground Air (AGA) systems in the 400 MHz band" (February 2007) provides information on the impact of TEDS on existing PMR/PAMR systems in the frequency range 380-470 MHz and on military radio applications below 400 MHz;

Harmonised standard: EN 302 561 [6] (covers channel bandwidth of 25 kHz, 50 kHz, 100 kHz and 150 kHz).

### **A1.2 NARROW BAND DIGITAL LAND MOBILE SYSTEMS**

#### **A1.2.1 DMR (Digital Mobile Radio), TETRAPOL, Project 25, and other digital 12.5 kHz land mobile systems**

Systems which comply with

Harmonised standard EN 300 113 [21].

#### **A1.2.2 TETRA and other digital 25 kHz land mobile systems**

Systems which comply with

Harmonised standards EN 300 113 or EN 302 561 [6].

## ANNEX 2: LIST OF REFERENCES

This annex contains the list of relevant reference documents.

- [1] Resolution 646 (Rev. WRC-15): "Public Protection and Disaster Relief" recommends to use regionally harmonised bands for BB-PPDR radio systems to the maximum extent possible, taking into account the national and regional requirements and also having regard to any needed consultation and cooperation with other concerned countries/regions"
- [2] Report ITU-R M.2014: "Digital land mobile systems for dispatch traffic"
- [3] Recommendation ITU-R M.1073: "Digital cellular land mobile telecommunication systems"
- [4] Recommendation ITU-R M.1457: "Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)"
- [5] ECC Decision (16)02: "Harmonised technical conditions and frequency bands for the implementation of Broadband Public Protection and Disaster Relief (BB-PPDR) systems"
- [6] ETSI Harmonised European Standard EN 302 561: "Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU"
- [7] ECC Report 102: "Public protection and disaster relief spectrum requirements"
- [8] ECC Decision (19)02: "Land mobile systems in the frequency ranges 68-87.5 MHz, 146-174 MHz, 406.1-410 MHz, 410-430 MHz, 440-450 MHz, and 450-470 MHz"
- [9] ERC Decision (96)01: ERC Decision of 7 March 1996 on the harmonised frequency band to be designated for the introduction of the Digital Land Mobile System for the Emergency Services (withdrawn and replaced by this ECC Decision (08)05
- [10] ECC Report 199: "User requirements and spectrum needs for future European broadband PPDR systems (Wide Area Networks)"
- [11] Report ITU-R M.2291: "The use of International Mobile Telecommunications for broadband public protection and disaster relief applications"
- [12] Report ITU-R M.2377: "Radiocommunication objectives and requirements for Public Protection and Disaster Relief (PPDR)"
- [13] Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
- [14] ERC Report 25: "The European table of frequency allocations and applications in the frequency range 8.3 kHz to 3000 GHz"
- [15] Recommendation T/R 25-08 "Planning criteria and cross-border coordination of frequencies for land mobile systems in the range 29.7-470 MHz"
- [16] ECC Report 22: "The technical impact of introducing TAPS on 12.5/25 kHz PMR/PAMR technologies in 380-400 MHz, 410-430 MHz and 450-470 MHz bands"
- [17] ETSI Harmonised European Standard EN 301 502: "Global System for Mobile communications (GSM); Harmonized EN for Base Station Equipment"
- [18] ETSI EN 301 511: "Harmonised EN for mobile stations in the GSM 900 and GSM 1800 bands"
- [19] ECC Report 39: "Technical impact of introducing CDMA-PAMR on 12.5 /25 kHz PMR/PAMR technologies in the 410-430 MHz and 450-470 MHz bands"
- [20] ECC Report 99: "TETRA Enhanced Data Services (TEDS): Impact on existing PMR/PAMR and Air Ground Air (AGA) systems in the 400 MHz band"
- [21] ETSI EN 300 113: "Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector"
- [22] Recommendation ITU-R M.1637: "Global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations"
- [23] Resolution 647 (Rev. WRC-15): "Radiocommunication aspects, including spectrum management guidelines, for early warning, disaster prediction, detection, mitigation and relief operations relating to emergencies and disasters"