



A review of the Spectrum Status for Broadband PPDR in Europe

This paper aims at presenting the current status of spectrum identification for Broadband PPDR (Public Protection and Disaster Relief) within Europe and ITU region 1 by extension.

Important Note

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Executive Summary

The PPDR community is convinced that both harmonised and dedicated spectrum is needed for future PPDR Broadband networks as the safest platform for future essential services. Harmonisation of spectrum will enable a vibrant, innovative and price efficient supply sector which can only be achieved on a global and regional scale whereas dedicated PPDR allocations may fulfil special national requirements.

Global – ITU-R - World Radio Conference 2015

The WRC-15 Final Acts [1] publish the WRC-15 modification of Resolution 646, being the ITU-R resolution which *inter alia* is consolidating all the global spectrum issues related to PPDR. The Resolution 646 (REV.WRC-15) keeps intact the band (380 to 470 MHz) for Europe, Middle East and Africa (ITU-R Region 1) which is used by many of today’s PPDR networks, while it goes on “to encourage administrations to consider parts of the frequency range 694-894 MHz, as described in the most recent version of Recommendation ITU-R M.2015, when undertaking their national planning for their PPDR applications, in particular broadband, in order to achieve harmonization....”. This is an extremely strong text, which de facto addresses current and new global markets for broad band PPDR equipment in the 700/800 MHz range. This Resolution also encourages Administrations to continue to work closely with their national PPDR communities to further refine the operational requirements for PPDR activities.

Regional - CEPT / ECC Decision

During its meeting June 2016 in Sweden, ECC Plenary approved ECC DEC(16)02 [2] which for the 48 CEPT countries narrows the 700/800 MHz option down to the 700 MHz range only.

For a harmonised PPDR spectrum allocation, this decision covers:

- Options in the Band 28 (2 x 30 MHz) between 703-733 MHz and 758-788 MHz already covered by the ECC Decision (15)01. Some countries have decided to auction this piece of spectrum for commercial use; some are willing to allocate it partly to PPDR organisations and services.
- 2x5 MHz and 2x3 MHz slots have been identified for PPDR and illustrated in yellow by the figure below.

470-694	694-698	698-703	703-733	733-736	736-753	753-758	758-788	788-791	791-821
DTT		PPDR UL	UPLINK Band #28	PPDR UL		PPDR DL	DOWNLINK Band #28	PPDR DL	DOWNLINK Band #20
	4 MHz	5 MHz	30 MHz	3MHz	17 MHz	5 MHz	30 MHz	3 MHz	

700 arrangement

- Since only the 700 MHz range can be considered as a stand-alone solution for the BB-PPDR requirements, it is considered as the core frequency range for enabling interoperability;

however the 400 MHz range can offer national flexibility, e.g. in the context of additional spectrum beside the 700 MHz range; therefore countries may allocate one of two sub-ranges in the 450–470 MHz range. The two defined ranges are 450.5–456 MHz / 460.5–466 MHz and 452.0–457.5 MHz / 462.0–467.5 MHz.

- Despite the performed co-existence studies, this ECC decision does not cover the 410–430 MHz range. This sub-band was discarded due to a lack of technical conditions even though some Eastern European countries have indicated an interest.

Allocations will be subject to national decision.

As a consequence of the adoption of ECC/DEC (16)02 for broadband PPDR, ECC has amended Decision ECC/DEC (08)05 for PPDR in the spectrum range 380–470 MHz to restrict its scope to narrow band and wide band PPDR systems.

EU activities and next steps

The 700 MHz band is in use by broadcasting and will need to be vacated before PPDR or commercial use is possible. In order to have an optimal transition process the Europe Commission has proposed draft Decision [3] of the European Parliament and of the Council on the use of the 470–790 MHz frequency band in the European Union. The draft Decision is covering two main issues:

- Switch off broadcasting no later than 30 June 2020. The Parliament is suggesting a grace period of 2 years for justified national reason.
- National use of mobile downlink in 470–694 MHz when not disturbing DTT reception.

The Commission has already adopted by comitology and published in April 2016 the Commission Implementing Decision (EU) 2016/687 [4] specifying the least restrictive technical conditions for using the 700 MHz band. PPDR is listed as a potential user of parts of the band 698–736 MHz paired with 753–791 MHz. This Decision does not recognise PPDR specific spurious emission limits for DTT channel 48 protection other than those in ECC DEC (16)02.

Again – allocation of specific spectrum will be subject to national decision.

3GPP consideration and next steps

Band 28 is already standardised within 3GPP and the CEPT co-existence requirements are independent of usage; same conditions for Commercial use or PPDR use.

In order to cover the 700 MHz band extension for PPDR allocations, and specifically by Middle East administrations, 3GPP RAN has approved a new band, called Band 68 and addressing 698–728 MHz / 753–783 MHz. Co-existence requirements are not the ones expected within CEPT and included into ECC DEC (16)02. The only significant difference is coming from the requested level of out of band emissions (OOBE) into the broadcasting channel 48 (686–694 MHz).

Based on theoretical co-existence studies and agreements between the various stakeholders, the ECC DEC (16)02 is specifying a level of -42 dBm / 8 MHz in the band 470–694 MHz whereas the new

3GPP Band 68 only provides -25 dBm / 8 MHz. ECC Plenary have therefore asked 3GPP to take that difference into account in a future revision of the standard. A WID (Work Item Description) together with election of a rapporteur will be considered in RAN4 and RAN for consideration.

In UAE and elsewhere throughout ITU-R Region 3 an OOB level of -25dBm / 8MHz is defined. Therefore, Industry is now preparing field trials at several different OOB levels. The aim is to demonstrate that the -25 dBm / 8MHz OOB level could be sufficient for CEPT, now that this is the case in the Middle East and the Pacific Region.

The above mentioned additional ranges in ECC DEC 16(92) - 450.5-456 MHz / 460.5-466 MHz and 452.0-457.5 MHz / 462.0-467.5 MHz will also need to be worked by 3GPP as there is no existing 3GPP standard for those ranges. As above, a WID (Work Item Description) together with election of a rapporteur should be considered in RAN4 and RAN.

Once industry has done the standardization works mentioned above, tenders launched by user organisations according to national regulations will determine if competitive markets exists.

References

- [1] Final Acts <http://www.itu.int/pub/R-ACT-WRC.12-2015/en>
ITU - World Radio Conference (WRC-15)
November 2015
- [2] Harmonised technical conditions and frequency bands for the implementation of Broadband Public Protection and Disaster Relief (BB-PPDR) systems
ECC DEC(16)02 <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCDEC1602.PDF>
17 June 2016
- [3] COM(2016)0043 final: DRAFT proposal for a decision of the European Parliament and of the Council on the use of the 470-790 MHz frequency band in the Union
EP Committee on Industry, Research and Energy
- [4] Commission Implementing Decision (EU) 2016/687 of 28 April 2016 on the harmonisation of the 694-790 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services and for flexible national use in the Union
<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016D0687&from=EN>