

Welcome to the World of Standards



CLOSING REMARKS

ETSI – CEPT/ECC Workshop “Public Protection and Disaster Relief: Regulatory changes and new opportunities for Broadband PPDR”, 29 September 2016, ETSI

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- **Highlights from the presentations**
Issues raised, discussion (Sessions 1 to 4)
- **General Conclusions (Session 5)**
- **Next steps and follow-up (Session 5)**
 - In the area of standardisation,
 - In the area of regulation,
 - On national level.
- **Link to Workshop Programme**
www.etsi.org/PPDR-WORKSHOP
- **Link to presentations**
https://docbox.etsi.org/Workshop/2016/201609_PPDR_WORKSHOP

Session 1

The objective of session 1 was to generally inform the audience about the status quo on BB-PPDR achievements, and also about what has been left without a solution yet.

Issues raised:

- Interrelation between ETSI, ECC, EC and CENELEC, role of ITU. MoU ETSI-ECC.
- Various Technical Bodies within ETSI are involved in PPDR.
- ETSI standards take into account all relevant scenarios.
- ETSI also develops standards to support interoperability, and contributes to CEPT/ECC on requirements for public safety (not only on spectrum).
- Harmonised standards based on RE-D.
- A temporary emergency communication cell could also be linked/backhauled to the permanent infrastructure by means of a bi-directional satellite link.

Session 1 (cont.)

Issues raised (cont.):

- Definition of use cases and deployment scenarios.
- All compatibility and sharing studies as well as regulatory studies have been finalised within CEPT/ECC.
- Amount of spectrum for PP2 scenarios: 2 x 10 MHz (uplink/downlink).
- The spectrum regulation has been finally approved (ECC Decision (16)02), it contains options in the 450 MHz and 700 MHz ranges and usage conditions (limits).

Session 1 (cont.)

Discussion:

- Same technology for different applications could cause difficulties (see experiences on GSM/GSM-R). E.g. coexistence issues at 700 MHz are relevant (PPDR/MFCN).
- Amount of spectrum for BB-PPDR: Different blocks (e.g. 5 MHz) could be combined (based on dedicated, commercial or hybrid model).
- Uplink block 698-703 MHz is challenging because of limit of -42 dBm / 8 MHz below 694 MHz (ongoing considerations in 3GPP).
- Increasing the power for the UE (> 23 dBm), e.g. in 700 MHz or 800 MHz, would need additional technical studies.
- How will the drive on 5G in 700 MHz impact the conditions for BB-PPDR? This is a general question, also related to other frequency bands (for MFCN, e.g. 800 MHz, 900 MHz).
- Collaboration between CEPT and other regions? This is contribution driven and based on the process within the relevant region; 400 MHz bands are very complex and fragmented in Europe.

Session 2

The objective of session 2 was to inform the audience on what has been done so far in the area of standardisation (including already agreed work items).

Issues raised:

- Development and standardisation of TETRA (narrow band (25 kHz), wide band (≤ 200 kHz)), BB services based on LTE technology.
- Evaluation of spectrum requirements and user requirements for BB-PPDR.
- Activities in 3GPP, 3 stages: Requirements, Architecture, Protocols.
- 3GPP (SA WG6): PPDR features, development from release 12 up to release 15 and beyond, including 5G in the future.
- Interworking of LTE and non-LTE mission critical systems.
- Plug test: A tool for the ETSI technical group to validate and enhance the quality of their standards; an opportunity for implementers; to support industry. It is not part of a certification process! MCPTT (Mission Critical Push to Talk) plug tests to support industry in the deployment of 3GPP Rel-13 mission critical networks.

Highlights from the presentations

Session 2 (cont.)

Discussion:

- Work is in progress on DMO within 3GPP (ProSe). Device-to-Device communication according to the specifications, for commercial as well as for public safety services.
- A key aspect for the specifications is the interoperability of equipment. Although specifications are not mandatory from a legal point of view, administrations can decide on the features to be implemented.
- Work Item for a Harmonised Standard for PPDR within ETSI? A Work Item has not been approved so far. Situation needs to be clarified.
- Current air interfaces for LTE suitable for PPDR? 3GPP TSG RAN is responsible for that (see also Session 4, discussions on “Band 68”).

Session 3

The objective of this future oriented session was to exchange views and ideas on possible implementations for BB-PPDR on national level including the identification of potential challenges.

Issues raised:

- UK:
TETRA network (private operator) for all emergency services and agencies, until end of 2019.
Broadband mobile PPDR services will be provided by a commercial network operator (EE).
Backhaul also partly via satellite. Gateways for extended coverage.
- France:
Currently 2 national Tetrapol NB-PPDR networks, end of support by 2025.
Expected start of new solution (BB-PPDR) in autumn 2017.

Session 3 (cont.)

Issues raised (cont.):

- France (cont.):

Standardised solutions required to support multiple vendors.

New BB-PPDR network should be able to adopt future technologies, especially 5G.

1 mission-critical communication system in the future, interoperability with energy and transportation enterprises which operate their own PPDR LTE network.

Able to link to government IT networks and roam to commercial mobile networks.

- Scandinavian Countries:

Country wide TETRA networks currently in Norway, Sweden and Finland.

Parts of the 700 MHz range, not auctioned for public mobile services, available for dedicated BB-PPDR networks.

Additional coverage (dedicated PPDR network) in non-profitable areas (for public mobile operators).

Session 3 (cont.)

Discussion:

- (Country wide) TETRA (or TETRAPOL) networks for PPDR are currently in operation. Migration concepts are needed on national level to move to LTE (BB-PPDR).
- Selection of a commercial mobile operator for providing BB-PPDR services (how, only 1 or ...)? Roaming on national level with other networks?
- Finland will auction 2 x 30 MHz in 700 MHz for commercial before the end of the year. Use of the future use of the optional bands, i.e. 2 x 5 MHz and 2 x 3 MHz will be decided later on. Aim to implement PPDR in commercial networks.
- UK will implement a “pre-standards” solution with the intention to migrate to a standards-based solution over the first contract.
- Nordic countries intend to install linked networks across SE, NO, FIN.
- The aim is to implement BB-PPDR solutions based on a 4G network. However, 5G in the future could lead to an amendment of the current regulation (this is also the case for MFCN bands).

Session 4

The objective of session 4 was to introduce the ongoing work and to identify necessary future activities from industry and stakeholder perspective including the identification of potential challenges.

Issues raised:

- “Connected police” (police officer in the future).
- PPDR requirements, a core set of specifications, roadmap for procurement, interoperable radio communication solutions.
- User and service prioritisation for public safety allow to share costly resources.
- Concept of flexible harmonisation in the 700 MHz range.
- Protection of TV channel 48 (-42 dBm / 8 MHz) is challenging from industry point of view; coverage problem by using the 2 x 5 MHz at 700 MHz expected.

Session 4 (cont.)

Issues raised (cont.):

- Proposals made in a joint contribution at RAN4#80 meeting in August 2016:
 - 1) To include the technical conditions as defined in ECC Decision (16)02;
 - 2) To modify Band 68 (698-728 MHz / 753-783 MHz) 3GPP specifications to include UE emissions levels for BB-PPDR in 698-703 MHz / 753-758 MHz;
 - 3) Introducing the limit of -42 dBm / 8 MHz (-30 dBm / 8 MHz under extreme conditions) in the range below 694 MHz into 3GPP specification;
 - 4) To update the UE to UE coexistence table in 3GPP TS 36.101 to include the European band plans, for the use of Band 68 in Europe;
 - 5) To introduce high power UEs (37 dBm) for the band 450.5 456.0 MHz (uplink) / 460.5 466.0 MHz (downlink) and 452.0 457.5 MHz (uplink) / 462.0 467.5 MHz (downlink) into 3GPP specification.

Session 4 (cont.)

Discussion:

- Power reduction mechanism in 698-703 MHz (uplink) would impact the coverage. Additional filtering would solve the problem.
- Transmit bandwidth reduction mechanism would not impact coverage.
- Consideration of NB-IoT.
- Coverage is a major aim and could require „high power“ user equipment from PPDR user point of view.
- High power terminals for commercial networks (providing PPDR services)???
- High power terminals for gateways (see UK Home Office proposal to 3GPP)?
- Consequences of deviations between 3 GPP specifications and ETSI standards (e.g. regarding the limit for the protection of the Broadcasting Service below 694 MHz)?

General Conclusions (Session 5)

- Basic mission critical functionalities already covered in 3GPP specifications (to some extent), releases 12 and 13.
- Ongoing close cooperation between ECC, ETSI, 3GPP.
- Interoperability is a key element for PPDR (base standards need to be complemented by standard conformance and interoperability specifications).
- Coverage is a key issue for PPDR.

- In the area of standardisation (3GPP, ETSI):
- Interoperability needed (technology coming from different vendors, for different segments).
- Further activities required within 3GPP with regard to the 2 x 5 MHz at 700 MHz (698-703 MHz (uplink) / 753-758 MHz (downlink)), taking into account the limits as defined in ECC/DEC/(16)02, especially for protecting the Broadcasting Service below 694 MHz (TV channel 48).
- Further activities required within 3GPP with regard to the 2 optional bands arrangements in the 450 MHz range according to ECC/DEC/(16)02 (UE power limit: 37 dBm, protection of the Broadcasting Service above 470 MHz (TV channel 21)).

Next steps and follow-up (Session 5)



- In the area of standardisation (3GPP, ETSI) (cont.):
- Future PPDR system should be able to adopt future technologies, especially 5G.

Next steps and follow-up (Session 5)



- In the area of regulation (CEPT/ECC):
- To further consider the 400 MHz range. 410-430 MHz is under consideration for BB-PPDR and 410-430 MHz and 450-470 MHz are under consideration for broadband commercial LTE based solutions.
- Spectrum regulation needs to be reviewed in the future (need to adopt to future technologies such as 5G?).
- AGA and DMO will be further discussed.
- Following the 3GPP discussions (UE output power > 23 dBm ?, limits to protect the Broadcasting Service below 694 MHz).

Next steps and follow-up (Session 5)



- In the area of regulation (CEPT/ECC) (cont.):
- Synergies to be discussed (energy sector, transportation, railway applications).

- On national level:
- Decision on BB-PPDR solution based on options as provided in ECC/DEC/(16)02 (dedicated, commercial, hybrid network?; frequency band(s)?).
- Hybrid model seems to be the solution in various countries (as far as information is available), purely dedicated networks are too expensive, purely commercial solutions wouldn't provide the resilience needed for PPDR without appropriate hardening. One or the other aspect dominates (depending on the country).
- To be decided how to use the 400 MHz ranges on national level (PPDR, PMR/PAMR, MFCN, smart grid, ...).

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Thank you!