Direction de programme du réseau radio du futur

5G spectrum for industry verticals Webinar

18 June 2020

Agenda

1 **The legacy paradigm**

2 Dedicated spectrum in 4G is not enough

3 The new paradigm of verticals and services

Legacy networks used to need dedicated spectrum

1 A dedicated infrastructure

With a specific technology for security needs like TETRA, TETRAPOL or P25.

The spectrum had to provide a good coverage with few sites (bands under 500 MHz) in narrow bands (12,5 KHz)

2 Narrow band and resilience

The needs were mainly voice and short data services

- High resilience with: **dedicated** teams, batteries
- **Dedicated** terminals

3 Several models of exploitation

- Directly by the government (France…)
- Through a dedicated state agency (Belgium)
- Through a dedicated commercial operator (UK, Spain)
- A difficult evolution to Broadband and a need of new investment, **only for PPDR requirements**

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2 **Dedicated spectrum in 4G**

3 The new paradigm of verticals and services

A new model in 4G mixing commercial infrastructures and dedicated systems with their own spectrum

A **hybrid** network

The infrastructure mainly uses commercial operators networks with priority/ preemption and national roaming

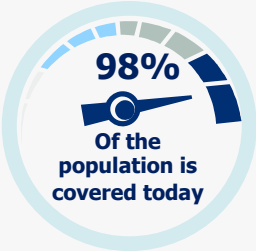
The RRF benefits from improved coverage, evolution and investments of the commercial networks

Dedicated spectrum used by systems to improve the resilience.

A **quick capacity evolution**

NATIONAL COVERAGE

An immediate and improved national coverage with MNOs



4G Broadband

Multimedia services, geolocalisation

HIGH**CAPACITY**

MNO networks are designed for millions of subscribers

Tomorrow, **improved services**

NEW DEAL MOBILE 2018-2025

MNOs have committed in improving coverage for white zones in exchange of a longer duration of actual licences in 4G

5G is coming

Starting in **2021**, with massive investments from MNOs, new services and bespoke networks for verticals

The dedicated spectrum is the first-aid kit for PPDR networks

1

Ability to quickly deploy an on-demand infrastructure in case of outage or lack of coverage

2

Need of more spectrum if more users have to use this temporary infrastructure

3

Licensed shared access is a possibility to get temporarily more spectrum

4

Other tracks to get the required spectrum (bubbles rented to MNOs)

5

Swapping spectrum for service in some areas exploited by Vital Importance Operators

Tactical networks

Several sizes can be used

Infrastructure tacticals which can involve several eNodeB, generally with backhaul

Event bubbles: standalone or with backhaul

Manpack: mainly standalone

Small bubble in vehicles

For planned events

- Radio studies may be mandatory
- Need dedicated staff
- Long Notice
- Generally hundredth of users: **need more spectrum**

For small planned or unplanned events

- **Quickly deployed**
- For small areas and a few scores of users

For special ops

- Quick and easy to deploy
- Do not need dedicated staff
- Can be used in confined spaces
- Can replace direct modes

For daily duty

- BYOC: Bring Your Own Coverage concept
- Standalone or Backhaul with enhanced MNO antennas or satellite

PPDR spectrum

- **3 MHz Band 28 – 5 MHz Band 68**
- Several tracks to get more on demand:
  - LSA
  - Rented bubbles

Dedicated infrastructures

Dedicated antennas indoor or outdoor to cover specific areas

Swapping frequency against service with some private LTE Networks

For areas where MNOs have no coverage

- Because it is not possible (military areas)
- Because they have no clients there (mountains…)
- Indoor
- More spectrum could be easier to get (no MNO present) but to be negotiated
- Can heve the relevant resilience level (depends on the budget you can afford)

For vital operator premises

- Sharing infrastructure: minimize the investment for both
- Improves the density of use of PPDR frequencies
- Facilitate the interoperability between PPDR user and vital operators
- More

PPDR spectrum

- **3 MHz Band 28 – 5 MHz Band 68**
- Several tracks to get more on demand or permanently:
  - LSA
  - Rented bubbles
  - …

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2 Dedicated spectrum in 4G

3 **The new paradigm of verticals and services**

The slicing in 5G will bring new services in a virtualized world

5G will be mainly a MNO issue but PPDR needs are still very specific

A global management of the spectrum for all the **verticals** to get the right service, at the right place and the right time

All the verticals will be more depending one another in front of the MNOs

- We will have to negotiate the **services** and not how the MNO implement them
- What space will be left for **private 5G** ?
- Will the cooperation with vital operators still be relevant for PPDR in 5G ?

How to go to the final stretch in case of big outage

- Tactical networks will still be necessary
- 4G solutions could fit temporarily but won't meet the needs in the end.
- More PPDR spectrum could be available in the bands from 470 to 700 MHz given up by broadcasting service and not claimed by MNOs
- **How to integrate tacticals in 5G ?**

Dedicated PPDR spectrum in 5G ?

5G will be mainly a MNO issue but PPDR still need dedicated spectrum

The 4G spectrum bestowed to PPDR in Europe is not the most efficient part of the available spectrum (many protections for band 68). 5+3 MHz

The regulators could have the same approach in 5G

- Allocate bands not claimed by operators
- A spectrum difficult to exploit for many reasons (protection, ecosystem)
- Maybe not a harmonized spectrum between countries

What can we do to get 5G spectrum

- Determine a **harmonized** 5G spectrum in Europe for PPDR
- Have it **standardized** (3GPP, ETSI, CEPT…)
- Start **negotiations** at a **national level** for countries interested in it
- Spectrum being a **national issue**, it is difficult to get an European policy

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Questions ?

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