

Dedicated Radio Spectrum under harmonised conditions - a fundamental requirement for Mission Critical Communication

It is generally accepted that mobile data communication transforms the efficiency and effectiveness of all those for whom communications are a normal part of everyday's life. Therefore the European Commission has sought advice on how to manage the ever increasing demand for spectrum and how to address the needs of the diverse set of users requiring access to this finite resource.

Representatives of the Public Protection and Disaster Relief (PPDR) community, through the Radio Communications Expert Group of the Law Enforcement Working Party, have been evaluating their user needs in order to assist CEPT FM PT49 consider how to efficiently provide sufficient spectrum for their future mobile broadband needs. Other agencies responsible for the management and protection of Critical Infrastructures are similarly setting out their future requirements for mobile broadband communications.

For those who are not familiar with the manner in which critical communications are provided and utilized it may appear to be an obvious solution simply to direct critical communications to take place over commercial cellular networks. However, there are many hidden pitfalls to such an obvious solution.

This paper discusses the link between the need for harmonized and dedicated spectrum and the associated options available to governments who may be considering future mission critical broadband communication services for their national emergency authorities and for the management and protection of vital infrastructures, including utilities and public transportation networks.

As a direct consequence of any spectrum decision that might be taken, governments will only have few options; i) Build, operate and manage their own network, ii) Outsource the build and operate and manage the service contract, iii) Acquire service from the market on terms the market is willing to accept.

The paper then considers specifically guaranteed availability of an outsourced service – in other words – Guaranteed Service Continuity.

Although the PPDR community uses the term – Mission Critical - all the time, we have slightly different definitions of the term which can be used to explain to each other what it means.

The Law Enforcement Working Group of the European Union has this definition:

- ***‘Mission critical operations’ for PPDR organisations address situations where human life and goods (rescue operations, law enforcement) and other values for society are at risk, especially when time is a vital factor.***
 - ***This means we define ‘mission critical information’ as the vital information for PPDR to succeed with the operation.***
 - ***‘Mission critical communication solutions’ therefore means that PPDR needs secure, reliable and available communication and as a consequence cannot afford the risk of having failures in their individual and group communication (e.g. voice and data or video transmissions).***

One can also separate the subject of mission critical communication into a number of categories:

- Specific functionality
- Quantitative requirements – including availability
- Implementation requirements – including availability
- Operator requirements – including availability.

The PPDR community at large is convinced that harmonised and dedicated spectrum is needed for future PPDR Broadband services and have come together to agree – see attachment - that such harmonised and dedicated spectrum should be based on a ITU-R Resolution at the ITU-R World Radio Conference in 2015.

The same community has also agreed that LTE should be the basis for the mobile broad band technology choice. Whereas the specific LTE functionality is being addressed and standardised in 3GPP (direct mode and group working being the most important in the short term), the Quantitative, Implementation and Operator aspects are specific to each network and very high availability is one of the many significant differences between the service normal offered by commercial operators and that required by mission critical activities.

Availability and Service Continuity.

Availability is typically considered at a technical level, and that is quite sufficient when a network is owned and operated by the PPDR organizations themselves. However, when a communication service is being outsourced, availability becomes more complex. PPDR organizations across Europe have extensive experience with outsourced service provision as today's PPDR networks in about a third of European nations involve commercial companies as operators. Those operators typically have to adhere to a number of unusual legal provisions - examples are listed here:

- Ownership of the operator company has to be approved and no change in ownership is allowed until re-approved. The owner(s) shall guarantee the contract. Any transfer of shares, merger, demerger, change of capital etc. will need to be approved.
- Contracts don't recognize "force majeure" – any service defect in this kind of service provision – particular in extreme situations - may cost lives or put national security at risk.
- Operator staff including sub-contractors must be security approved and have special employment contract reflecting the extraordinary service conditions i. e. no right to strike.
- Continued external rating of the financial health of the operator shall take place and owners must inject extra capital if deemed needed. If the owners refuse – control of the operator company will be handed over to the government.
- Extraordinary penalty regime for non-performance – also applicable in extreme situations.

Governments use such legal instruments to guarantee availability of an outsourced service and existing mission critical service operators can meet those requirements because they are specialized operators often created specifically to meet those unique needs of governments.

Traditional mainstream commercial mobile operators providing service to the general public will generally not be willing to sign-up to the above listed type of legal conditions. Availability of radio spectrum for mission critical services is therefore of fundamental importance for specialized operators aiming at providing broadband services as they today provide voice services. The alternative would be that no real mission critical broadband service can be realized.

It is clear from the above observations that Mission Critical Mobile Broadband services cannot be acquired from standard commercial operators. Mission critical users have decades of experience in developing high availability, highly secure and highly resilient voice communications.

Their requirements for broadband systems will be no different and these requirements cannot easily be met by carriers with only commercial imperatives at the heart of their decision making.

In times of crisis it is not acceptable for high network load to limit the ability of public safety and other critical services to communicate. It is not acceptable for commercial imperatives to limit the resilience of a network that is used by mission critical users and neither is it acceptable for the ownership of such networks to be transferred simply on the basis of commercial gain.

Mission critical broadband services are a vital and increasingly urgent requirement for PPDR and other critical communications users, including but not limited to national security, vital infrastructure management and protection, utilities and transportation operators and others. Unless the necessary harmonized and dedicated spectrum in which to operate such services becomes available throughout Europe and further afield, it will not be possible to implement the critical services that are vital to the safety, security and well-being of the citizens, the communities and the nations.

Attachment:



**Statement on spectrum for critical communications mobile broadband
from the TCCA Board**

Considering:

- That the upcoming World Radio Conference in 2015 (WRC-15) has agenda items:
 - 1.2: to examine the results of ITU-R studies, in accordance with Resolution 232 [COM5/10] (WRC-12), on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;
 - 1.3: to review and revise Resolution 646 (Rev.WRC-12) for broadband public protection and disaster relief (PPDR), in accordance with Resolution 648 [COM6/11] (WRC-12);
- That one of the strategic objectives of the TCCA is to seek to drive the adoption of suitable harmonised spectrum for mobile broadband data for PPDR;
- That WRC-15 gives an unique opportunity to reach a harmonised solution;

The TETRA & Critical Communications Association (TCCA) has concluded that the highest priority is to support the preparatory activities for WRC-15 agenda items 1.2 & 1.3 (in a combination of the two) to maximise the chance of having PPDR taken into account in agenda item 1.2, and to ensure early release of enough harmonised frequency allocation for PPDR broadband after WRC-15.

The goal of the TCCA is to provide a forum for all those that have an interest in the provision of wireless communications in a mission critical or business critical environment. The TCCA believes in the principle of open and competitive markets through the use of common standards and harmonised spectrum worldwide. The TCCA continues to support and promote the use of TETRA technology and is also driving industry synergy in the development of future mobile broadband capability for the users and providers of critical communications.

The TCCA represents more than 160 organisations from all continents of the world. Membership includes government organisations, user organisations, manufacturers, application providers, integrators, operators, test houses and telecom agencies.