

Comments / counter-comments to Consultation Paper on Next Generation Public Protection and Disaster Relief (PPDR) communication networks

1. Do you consider the existing fragmented model of PPDR communication network in the country adequate to meet the present day challenges? If not, what are the deficiencies in the existing model of PPDR?

1. First Responders should be able to use benefits of innovations in mobile technology and private captive mobile networks should be allowed. This would enhance their capabilities – services, coverage, mobility, handover and use of commercially available mobile handsets.
2. Mobile based technology can aid in providing emergency communication to mobiles of affected population, which can be extended to full-fledged search and rescue capabilities for First Responders. Currently, this does not come under purview of First Responder Agency and is dependent on Mobile Operator. Communication for Survivor, and mobile technology based Search and Rescue should come under purview of First Responder Agencies.
3. Last mile solutions for First Responder should allow integration of mobile Wi-fi and Legacy Radio technologies for better coverage, capacity and services.
4. Network integration with commercial mobile and fixed line networks should be simplified. E.g. First Responder can have pre-integrated interconnects with commercial mobile networks and once deployed at disaster site and backhaul availability, external world connectivity can be provided to affected population. Appropriate congestion control measures shall be implemented by First Responder.

Existing PPDR bands are no use for affected population. Policy makers should allow setting up emergency communications network by First responders that can enable use of normal mobile handsets. First responders use;

- a. HF, VHF sets 3.5 to 29.7, 50-146 Mhz
- b. Tetra (Terrestrial Trunk Radio), an exclusive Government Radio Network (GRN) used at times of Commonwealth games working in 400 MHz band and by GAIL and DMRC, Kerala state
- c. PMRTS is licensed to 9 companies (40 Licensed areas) used within manuf. industries, transport cos. 806-824 MHz paired with 851-869 MHz
- d. ISM band is used by Wi-Fi Access points and Point-to-point radios, 2.4GHz and 5.8GHz. SIP server/ SIP phone app on smart phones using WiFi

...No solution exists for affected population when commercial cell phone networks are down.

IND-82 of the current NFAP says “Requirement of public protection and disaster relief (PPDR) communications. including Broadband Wireless Access may be considered, as far as possible, in the frequency bands 380-400 MHz, 406.1-430 MHz, 440-470 MHz, 746-806 MHz, 806-824/851-869 MHz, 4940-4990 MHz and 5850-5925 MHz on a case-by-case basis depending on specific need and equipments availability. (Related IND are 42, 43)”

Except PMRTS and TETRA, there are no other services. No specific solution exists in India for dedicated disaster response purposes and due to lack of any guidelines there are no equipments or services available. Scenario is changing world over and hence we wish to draw your attention on two aspects.

- 2. In the various models described in para 2.11-2.15, in your opinion which of the model (dedicated, commercial, hybrid) will be more suitable for Indian conditions? or Is there any other alternate model which would be more suitable for Indian telecom environment? Please provide rationale for the suggested model.**

Dedicated is recommended as it can offer availability, control and security which is needed at the time of disaster.

Commercial model is not suitable as debt laden operators are generally not willing to invest in PPDR. One such example is no interest in implementing priority routing of calls in their network.

Hybrid model would create confusion as to which are rural and which are urban areas and also create problems of interference resulting out of confusion.

- 3. Should PSUs be earmarked for providing nationwide broadband PPDR communication network? Please justify your answer.**

Single PSU/ Operator can not setup countrywide PPDR network serving agencies like NDMA/NDRF, para-military/ military, state disaster management agencies (SDMA)\ police \Fire protection etc.

Please refer to now proven case study available for the First net board. Firstnet includes public safety agencies, state governments, manufacturers, R&D institutions, reputed universities, and service providers. Further funds,

technology inputs and operations require wider participation of various stack holders.

So we recommend to adopt the same FirstNet model and go for wider participation and not just ask a particular PSU.

4. Will it be technically feasible and beneficial to permit PPDR trunking service roaming on public telecom networks? If yes, what challenges do you foresee in implementation of such an arrangement? Please justify your answer.

There is certainly a need for PPDR trunking on public telecom networks. But when this is allowed for general public there should be an implementation of network congestion control. So maybe in the initial 48 hours of disasters the solution may focus in the first responders and Govt. agencies and allow trunking later.

5. Can frequency bands be identified exclusively for public protection and disaster relief? What are the candidate bands for PPDR operations in India?

Proposed candidate bands are

- a. Use of Railway band (GSM-R) for areas away from railway track.
- b. Allocate band as 703-748 for UL and 758-803 for DL- leaving 10 MHz of central band. This is as per ITU Asia Pacific Telecommunity (APT) recommendation. The FDD system for LTE has to use a different sub-band for UL and DL. (A different proposal than FCC as used by the FirstNet that recommended 758-768 MHz/ 788-798 MHz for UL and DL). As per ITU APT for Region 3, any one or two 5+5 MHz or one 10+10 MHz channels can be used for broadband PPDR. Since documents like NFAP IND82 does not identify the exact sub-band or channel, it would be prudent to identify sub-band for exclusive PPDR use, and not just say ANYWHERE in the 703 to 803. We can be specific like "703-713 for PPDR uplink and 758-768 for PPDR downlink, with 748-758 as centre gap, and 698-703 and 803-806 as guard bands to be used for LTE for PPDR"
- c. Other option is to allow LTE FDD mode in addition to PMRTS in 806-811 (5 MHz) paired with 851-856 MHz (refer NFAP IND40) and bands 814-819 paired with 859-864 MHz (NFAP IND42). Channel allocation plan needs to be discussed with WPC to avoid interference with licensed PMRTS walky-talky systems.
- d. There are multiple bands for PPDR and we request you to allow Voice/GSM operation in the T-GSM (810 MHz) band. First responders may use tri-band phones supporting T-GSM band. First responders

can carry their own network-in-a-box and operate it for their own purposes to mitigate the risks emanating from failed communications network. Frequency bands 819-824MHz paired with 864-869MHz may be earmarked for cellular Telecom system for the use for offering GSM services under this PPDR band, and for use by pre-notified disaster management agencies and security forces.

- e. In addition to the access devices radio backhaul also may be provided permission for license free operation. It is proposed that 40 MHz of spectrum 1452-1492 (within in 1427-1535 MHz) frequency band for mobile Broadband communications networks for setting up of secure and dedicated captive communication network for PPDR, Para-Military and State Governments. It is also proposed that 40 MHz of spectrum in 3.3 GHz – 3.4 GHz frequency band for point to point (PTP) & PMP fixed wireless systems for Setting up of secure and dedicated captive communication Networks.

6. If wideband/broadband PPDR is to be implemented in India, what quantum of spectrum will be needed for such solution for PPDR?

Total 2x10 MHz allocated to a nationwide LTE wireless broadband network for First Responders, as in FirstNet. Looking at higher density one may even go beyond the ITU APT/ FirstNet recommendation and allocate additional 20 to 40 MHz for PPDR

7. What is the cost and benefits tradeoff envisaged for public protection and disaster relief viz-a-viz commercial value of spectrum?

There does not have to be a trade-off between commercialization and social protection. Commercialized and profitable telecom ecosystem does not mean much if democratically elected government fails to respond to the disasters and focus on saving lives.

On the other hand spectrum is a scarce resource and has to be allocated for genuine purposes.

8. Do you suggest any other workable option that can be adopted?

In view of harmonization of spectrum and India willingness to align to the WRC-15 recommendations, workable option is to follow international practises.

This also allows trouble in testing and homologation of technologies made specific to a region.

9. Please give your comments on any related matter not covered in this consultation paper.

One may allow exclusive use of PPDR spectrum to Government agencies for their internal communications, when not used by DR agencies. No commercial exploitation may be allowed in the PPDR spectrum.

ITU Wireless Radio-communication Conference (WRC-2015):

1. Amateur radio: 5351.5 - 5366.5 kHz for use in disaster situations and for relief operations.
2. Emergency communications and DR: 694-894 MHz frequency band to facilitate mobile broadband communications for PPDR. The current thinking of NFAP is to refuse usage of this band for the recommended purpose.
3. Search and rescue: Transmit in the 406-406.1 MHz to uplink to search and rescue satellites. Using this, the Cospas-Sarsat System provided rescue assistance to 37,000 persons in 10,300 incidents worldwide.
4. Civil aviation: 1087.7-1092.3 MHz allocated for reporting the position of aircraft equipped with ADS-B globally
5. Maritime: Automatic Identification System (AIS) in 161.9375-161.9625 MHz

Discussion should also consider rail road, aviation, maritime related disasters, handling of stampedes in events involving masses and not just LTE-broadband.