BB-PPDR Network:
नागरिक सुरक्षा और आपदा राहत नेटवर्क

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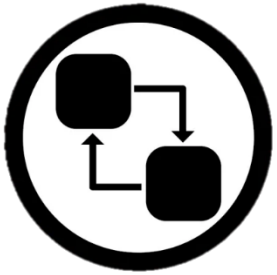



tline:

- TRAI Recommendations on PPDR Networks
- Existing Network of PP and DR Agencies
- PPDR Networks: Features
- Global Experience
- Building PPDR Networks for India
- Way Forward

TRAI gave its recommendation on 4th June, 2018 to establish a Pan India Integrated Network for communication among Public Protection Agencies and Disaster Relief Agencies

and DR - AGENCIES

Public Protection (PP)

First Responders

- Police
- Fire Services
- Medical Services

Disaster Relief (DR)

- SDRF/ SDMA
- NDRF/ NDMA
- Other Agencies

ployed Communication Technology

Public Protection (PP)

Short Distance:
VHF/ UHF (Analog/Digital)
Radio Trunking (TETRA or P25)

Long Distance:
HF/ VHF/ POLNET

Mobile and Telephone

Disaster Relief (DR)

Short Distance:
Police Network/
Portable Radio Networks

Long Distance:
Satellite Phones

Mobile and Telephone

BB – PPDR Network

- At present each agency establishes its own analogue/ digital communications network or use TSPs network.
- These independent networks do not talk to each other even at the need of hour.
- Generally these are narrow band, voice centric, analog networks with inherent security risk.

asthan Police Communication Network

- Multiple Frequencies and Multiple Technology
- Handsets: 10,000.
- One handset given in each District to Fire Service.
- No support for Medical Services
- ecurity : AES 256 Encryption for digital mode. No security or Analogue
- Most of the Equipment declared out of support by OEM
- Digital Trunking at Jaipur and Jodhpur. Now “End of Life” roduct.
- Constant efforts and attempts to upgrade network.

hi Police Communication Network

- Multiple Frequencies and Multiple Technology in use
- otal 15 Districts, 205 Police Stations in Delhi.
- 000 Handsets
- ecurity : AES 256 Encryption for digital mode. No security or Analogue.
- Order placed for 2500 numbers Handsets for PTX (Push to Talk) over OTT Network.
- roposal for establishment of new Digital Trunking System TETRA) at the estimated cost of Rs. 106 Cr for 4500 Handsets.

jarat Police Communication Network

Analogue and Digital Non-Trunking Communication Network

Network based on Gujarat SWAN, HF and VHF used for nter-district communications

VHF, UHF used for communication within a District.

Cities – Ahmedabad - Analog (5 Channels & 4 Reserve), GDN - Analog (2 Channel), Surat & Baroda - Both Digital

3 Districts – 8 on Digital & 25 on Analog Network

Handsets: 20,000

ecurity : AES 256 Encryption for digital mode. No security or Analogue.

Communication Network (1/2)

tate Emergency Operation Centre (SEOC) / District Emergen
peration Centre (DEOC)

- Dependent on conventional wireline/ wireless network
- VSATs at DHQ

ational Cyclone Risk Mitigation Project (NCRMP) –

- Coastal States and UTs
- Early Warning Dissemination System (EWDS)
- Trigger Mechanism: Mobile, DMR Network, Satellite Modems.
- Building of Disaster Resilient Shelters.

MR Network

- Odisha and Andhra Pradesh
- 5 to 10 KMs strip of coastal areas and Shelters

here were operational issues in DMR during Cyclone in AP.

Communication Network (2/2)

DRF having 16 Battalions, deploys:

Very Small Aperture Terminal (Ku Band)

- Every Battalion Headquarter is having fixed antenna VSAT
- One fixed antenna VSAT is for NDRF Headquarter.
- Every company is having quick deployable, foldable VSAT.

High Frequency

- Every Battalion Headquarter has fixed antenna along with backpack.

Very High Frequency

- VHF is used for short distance communication within a team.

nitations of present day networks (1/2)

nefficient use of spectrum.

Congestion: During emergencies and disaster network may et congested.

nteroperability: Network of each agencies work in silos.

Need for multiple handsets: i.e. Analogue non-trunking, DMR, Analogue Trunk and Digital Trunk Radios.

No video/ Limited Data.

ecurity: Analogue is non secure, whereas Digital is AES 56.

Obsolete Technology and Proprietary Equipment.

Higher Upgradation and maintenance cost.

nitations of present day networks (2/2)

- Operational issues faced during the event of disaster in the edicated network installed for Disaster Relief – DMR, atellite Phones
- The DR Network is not integrated with the network of First Responders i.e. Police/ Fire/ Medical.
- Lack of coordination among DR Agencies during disaster.

y Critical Features of MCX

- Complete Network coverage in operational areas
- ush to Talk (PTT) - Instantaneous Call Set-up in < 300 illiseconds
- Direct Mode Operation – Walkie-Talkie operation.
- Group Broadcast Calls i.e. one-to-many communications.
- riority with hierarchical Pre-emption.
- Ruggedized Weather Resilient Handset.

DR Network: Features (1/2)

- S-LTE based Network hardened for Public safety.
- GPP Compliant – Seamlessly being upgraded to 5G.
- ntegrated - Across Agencies – Across Cities & States
- Videos, Photos and Location Sharing – in MC Mode
- Group calls: Even for video, data and location sharing
- Wearables: Body-Sensors on commandos going forward in any critical operation or disaster rescue

DR Network: Features (2/2)

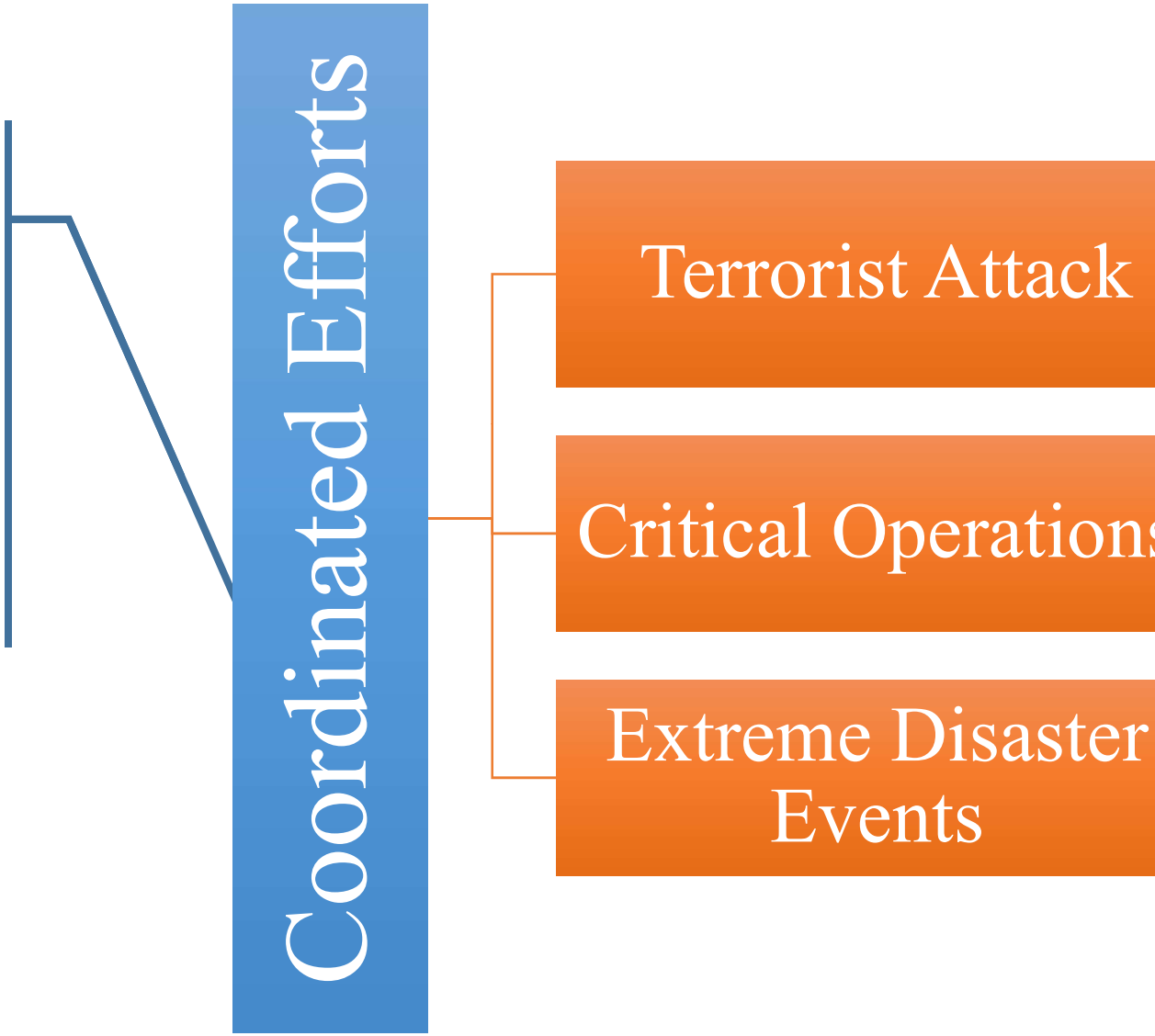
Legacy Network can be integrated

Capacity: Handles large traffic during extreme events

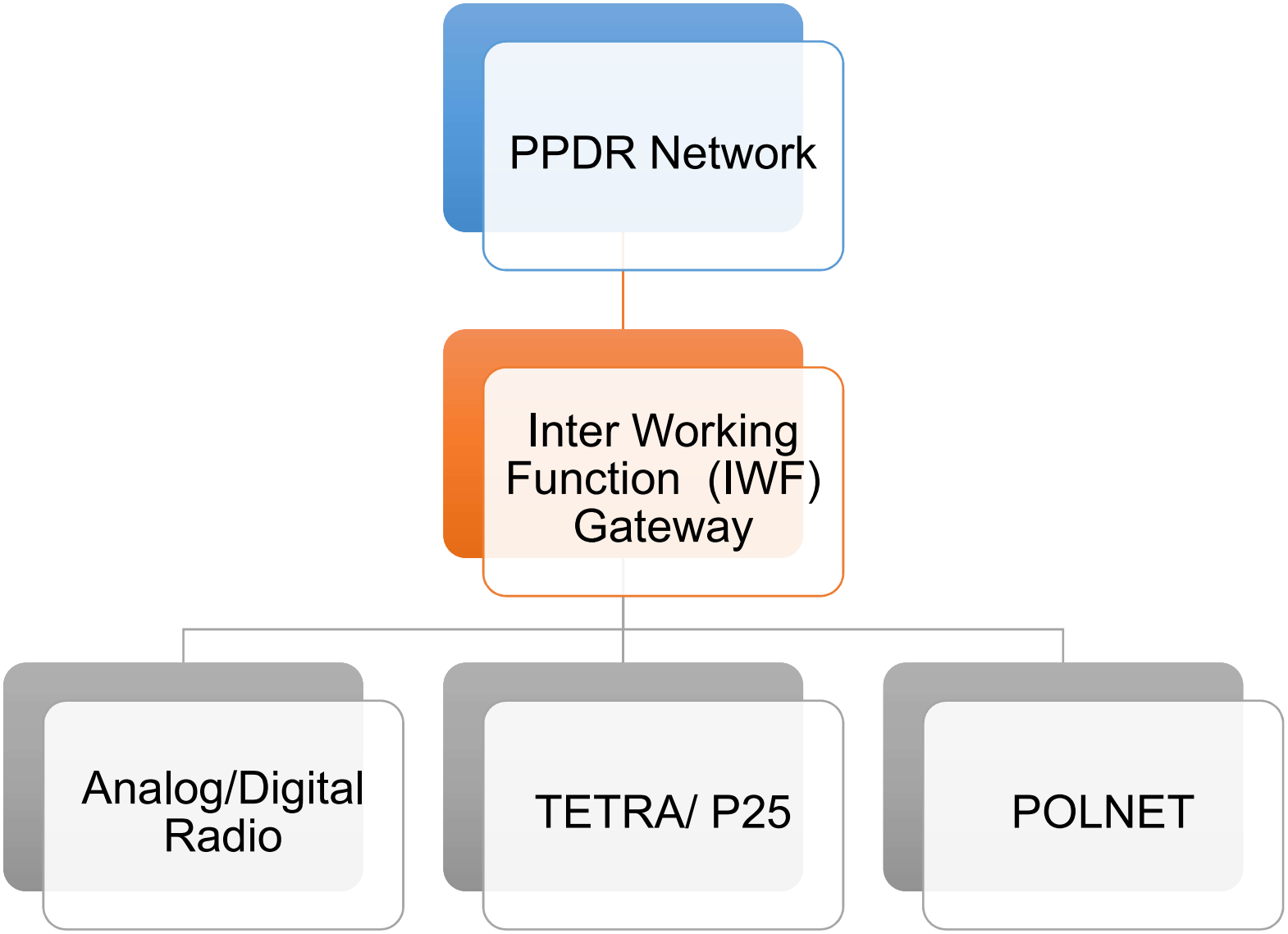
Reliability: Backend connectivity on OFC, Radio and Satellite
nsure reliability.

Cases for Integrated Network

- Integrated Network
- Sharing Video/ Data/ Location in MC mode.
- 5G Network
- Dynamic Grouping



gration with Existing Networks



PPDR: Global Approach for Implementation

Dedicated 4G LTE Network

- Hardened for critical communication
- Better security
- High upfront cost
- Require time to build network across country

Over Commercial 4G LTE Network

- Instant coverage
- Cost effective
- Prone to congestion during disaster
- Low commercial viability in remote areas

Hybrid Network

- Designed for extreme events
- Additional capacity can be used for commercial purpose
- Priority for MCX Calls
- Cost effective and Reliable

bal Scenario

US, Qatar, South Korea, Kenya and others have already deployed PPDR network.

UK, Finland, Australia, Canada have deployed partially and under full implementation.

Brazil, Thailand, France, Hong Kong, Japan, Mexico, Norway and Singapore have started implementation.

China – Phase-wise implementation. Deployed in many cities.

Model for PPDR Network

Recommendation of 9/11 communication.

FirstNet Authority created in 2012.

Mission: Nation Wide Integration on Mission Critical Network.

x 10 MHz spectrum given to AT&T (788-798/758-68).

th Korea Model for PPDR Network

outh Korea: **Korea Safe Net**

Dedicated Network over dedicated spectrum

Operates in **700 MHz spectrum**

33 public safety organizations

mplementation of Network: December-2018 to December-020.

Model for PPDR Network

UK Home Office: **Emergency Services Network** (ESN).

00,000+ frontline emergency service users (Handheld Device)

5,000 vehicles, 66 aircraft (Vehicle Mount Device)

00+ control rooms.

9,000 existing masts being upgraded

50 New masts being constructed.

ding a broadband PPDR Network for INDIA (1/3)

AI Recommendations – 2018 (RECAP)

Mission: Setting up a pan-India integrated BB-PPDR Communication Network based on 3GPP PS-LTE technology

Framework establishment: Forming a SPV under MHA to plan, coordinate and steer the implementation and subsequent operation of network.

Network Model: a hybrid model of BB-PPDR network in India

Spectrum: 2x10 MHz quantum of dedicated spectrum should be allocated nationwide to the SPV on no-cost basis (in frequency band 814-824/ 859-869 MHz).

Pilot Testing: Pilot testing prior to the implementation of BB-PPDR

ding a broadband PPDR Network for INDIA (2/3)

- MHA held meetings with States/UTs
- tates expressed desire for implementation of PPDR/ ilot study
- MHA exploring locations for Pilot Study

ding a broadband PPDR Network for INDIA (3/3)

Workshop held on 14.07.2022 for Knowledge Sharing and Capacity Building and attended by

- MHA, NDMA, NDRF, Delhi Police
- ITU, 3GPP, TEC, C-DOT
- OEMs – Samsung, Nokia, Ericsson, Motorola
- TSPs – Airtel, BSNL, MTNL, RJIO, Voda-Idea
- SI- Samsung, Sanchar Tele-System

y forward:

tanding Committee being formed by MHA

apacity Building based on Global Best Practices

llocation of spectrum by DoT

ilot Testing and Freezing of user requirements.

etwork Deployment in phased manner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