No. 25018/15/2018-PM-II
Government of India
Ministry of Home Affairs
(Police Modernization Division)
* * * *

Jaisalmer House, 26, Mansingh Road,
New Delhi, the 10th August, 2022

To

1. Head of SDMAs of all States/UTs
2. DsG of all CAPFs
3. DsG/Directors of all CPOs
4. Commissioner of Police (Delhi Police)
5. DsGP/ Head of Police of all States/UTs

Sub: Technical Advisory regarding Mission Critical Requirements of PS-LTE Networks

Madam/Sir,

I am directed to say that the Police Organizations and Public Safety Agencies use **reliable, highly available and secured communication network** for their day-to-day functions that include maintaining Law and Order, protecting lives and property and responding to emergency and disaster situations. The ready-to-use radio communication networks are also used for mission critical functions such as VVIP/VIP movements, tactical and covert operations etc. The Radio Communication Networks used by Police Organizations and Agencies have some **key critical features** which make them mission critical networks with command and control capabilities and thus sets them apart from commercial communication networks. These key features are referred at **Annexure-A.**

2. Earlier, Telecom Regulatory Authority of India (TRAI) considering interoperability issues and constraints of existing Narrow-band Networks, through its *suo moto* recommendations dated 04.06.2018, has recommended for setting up a Pan India National Broadband Public Protection Disaster Relief Network (BB-PPDR) based on 3GPP PS-LTE Technology. The recommendations include but not limited to the specific mention of Key Performance Indicators (KPIs 1,2,3,4) which are defined in 3GPP MCPTT specification of LTE Release 13. These KPI's should be agreed between Govt Departments/Coordinating agencies & Telecom Service provider (TSP) & Operator. The other salient features of TRAI recommendations are annexed at **Annexure-B**.

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3. Now, it has come to the notice that several standalone proposals based on Over-The-Top (OTT) applications hosted in some Application Servers are being proposed to the State/UT Police Organizations as BB-PPDR networks/Public Safety LTE (PS-LTE)/4G LTE Radios etc. These OTT Applications are claiming to provide MCPTT (Mission Critical Push-to-Talk) Service based on 3GPP Standards (through Application Server) in 4G LTE Handset by inserting SIM of any Telecom Service Provider. Since, these makeshift solutions are not providing mission critical services which are hosted in any Telecom Service Providers Network and are not going to meet the Critical parameters set apart by 3GPP PS LTE standards for mission critical networks. They would invariably be subjected to the network congestion typical of a commercial mobile network during heavy traffic use. Any solution for provision of Mission Critical services for Police Organizations and Public Safety Agencies has to meet the minimum key critical benchmarking/features that are already available in the existing Legacy LMR Networks.

4. The Over-The-Top (OTT) applications over server-based solutions available in the market which are claiming to provide MCPTT Service (through Application Server) in 4G LTE Handset (by inserting SIM of any Telecom Service Provider (TSP)) are not BB-PPDR Network solutions as are stipulated in TRAI recommendations. **Mission Critical Push-to-Talk (MCPTT) service is not Push-to- Talk over cellular (POC)** as being proposed from various quarters. MCPTT is a stringent requirement of BB PPDR Network, wherein the latency of call set up is extremely low to cater Mission critical functions of Police Organizations and Public Safety Agencies.

5. It is also claimed that these OTT Applications can provide calls with priority extended to these commercial calls by the Telecom Service provider whose SIM may be used in 4G LTE handsets. Here, it is important to clarify that unless this priority is provisioned with Pre-emption of the already ongoing commercial calls, it has no meaning and could well be called as courtesy priority only. Police Communication Networks engaged in Mission Critical functions has to have the Primary use of the Radio frequencies and Core Telecom Network resources. The Priority with Pre-emption has to be at all stages of Network Access and Call Set-up in the Telecom Service Providers Network. *Importance of Priority with Pre-emption can be understood with a simple analogy of movement of Ambulances and Emergency vehicles on a congested road. These vehicles have priority on road but unless the road is emptied of the vehicles already occupying the road ahead there is no clear path for availing the given Priority.* The minimum required key features as expected from the PS-LTE Network have been listed at **Annexure-C**.

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6. The OTT Applications available in various implementations which are posing to provide Mission Critical services cannot meet the Stringent KPI requirements of BB PPDR networks. Such solutions would be a barrier in deployment of an integrated, interconnected and interoperable Pan India BB PPDR network based on 3GPP PS-LTE standard as per recommendation of TRAI. Being the proprietary of the solution provider, these **standalone solutions which are not hosted in the Network of Telecom service provider** will entail silos in the Police Communication Network and would be prone to vulnerabilities and security issues as they would be operating through open Internet/Data Services of TSP.

7. It is therefore, emphasized that **at the minimum** the PS LTE Network must adhere to 3GPP PS-LTE Functional Architecture with all mission Critical services be hosted in the Network of a Telecom Service Provider only. Also, they must conform to the stringent voice Key Performance Indicators (KPIs) as per 3GPP standard for PS-LTE as annexed at **Annexure-D** & **Annexure-E** respectively.

8. It is requested that the above facts may be taken into account to ensure a reliable, highly available and secure communication network.

Encl: As above.

Yours sincerely,

D S Parihar 10/08/2022

(D. S. Parihar)
Deputy Secretary (PM-II)
Tele: 011-2384961

Copy to:

(i) PPS to Secretary (F and PM), Ministry of Home Affairs, NDCC Building, New Delhi.
(ii) PPS to Secretary (Telecom), Ministry of Communications, Sanchar Bhawan, New Delhi
(iii) PPS to Joint Secretary (PM), Ministry of Home Affairs, Jaisalmer House, New Delhi.
(iv) PPS to Director, DCPW, CGO Complex, New Delhi.

D S Parihar 10/08/2022

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Annexure-A

Key Critical Features of Existing Captive Police Communication Networks

1. Dedicated Spectrum & Network coverage in operational areas.
2. Push to Talk (PTT) - Instantaneous Call Set-up in < 300 milliseconds.
3. Direct Mode Operation (Without use of network infrastructure) - *Walkie Talkie operation.*
4. Group / Broadcast Calls (i.e., enables one-to-many communications) with provision of Dynamic regrouping.
5. Priority with hierarchical Pre-emption
6. Ruggedized Weather Resilient Handset.

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Annexure-B

Salient Features (*but not limited to this*) of TRAI Recommendations on "Next Generation Public Protection and Disaster Relief (PPDR) communication networks"

i. Putting in place a hybrid model of BB-PPDR network in India in which dedicated network for BB-PPDR communication funded by government be created in metro cities, border districts, disaster prone areas (identified by NDMA) and sensitive areas like J&K and North East by PSU like BSNL/MTNL. The existing commercial network can be leveraged in other regions through any TSP.

ii. Putting in place stringent SLAs (service lease agreements) by the SPV (Special Purpose Vehicle). Operators should be mandated to provide mobile BTS and backpack devices in case of disaster when terrestrial network gets damaged/ dysfunctional, in order to make available communication facilities for PPDR agencies within specific time limits as derived in SLAs.

iii. Carrying out pilot testing prior to the implementation of BB-PPDR dedicated network (dedicated spectrum and network) to be implemented through BSNL/MTNL, funded by the Central Government, at five zones identified as disaster prone/sensitive areas to evaluate the efficacy of the proposed network. The plan for migration of existing legacy equipment on to the new network is to be formulated after comprehensive study during this pilot testing.

iv. Testing the efficacy of PPDR trunking service roaming on public telecom networks during pilot testing, and if found feasible, it should be implemented on pan-India basis.

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Annexure C

Requirements of Mission critical features in a BB PPDR/PS-LTE network

1. Coverage where Police Agencies operate.
2. Mission Critical PTT voice along with Mission Supportive PTT data & PTT video without diluting the existing KPIs (Instantaneous Call Set-up in < 300 milliseconds).
3. Telecom Service Providers (TSPs) Network enabled MCPTT services only and NO server based over-the-top (OTT) applications, in the name of BB-PPDR/PS-LTE network that have appeared in the market in recent years.
4. Priority with Pre-emption (If call is shared with commercial cellular network calls then double pre-emption would be required – as the ongoing commercial call need to be terminated first and then the ongoing call in the PPDR user group, if any, would also need to be terminated on a Push-to-Talk call from higher authority is placed in the network.
5. Device to Device communication viz. proximity services.
6. Inter-operability with existing LMR networks & Seamless Integration across agencies.
7. Rugged Weather resilient handsets.
8. Disaster resilient network with minimum downtime. This requires hardened Radio Mast/towers and other physical infrastructures.
9. Robust Security mechanisms at all Network element levels.

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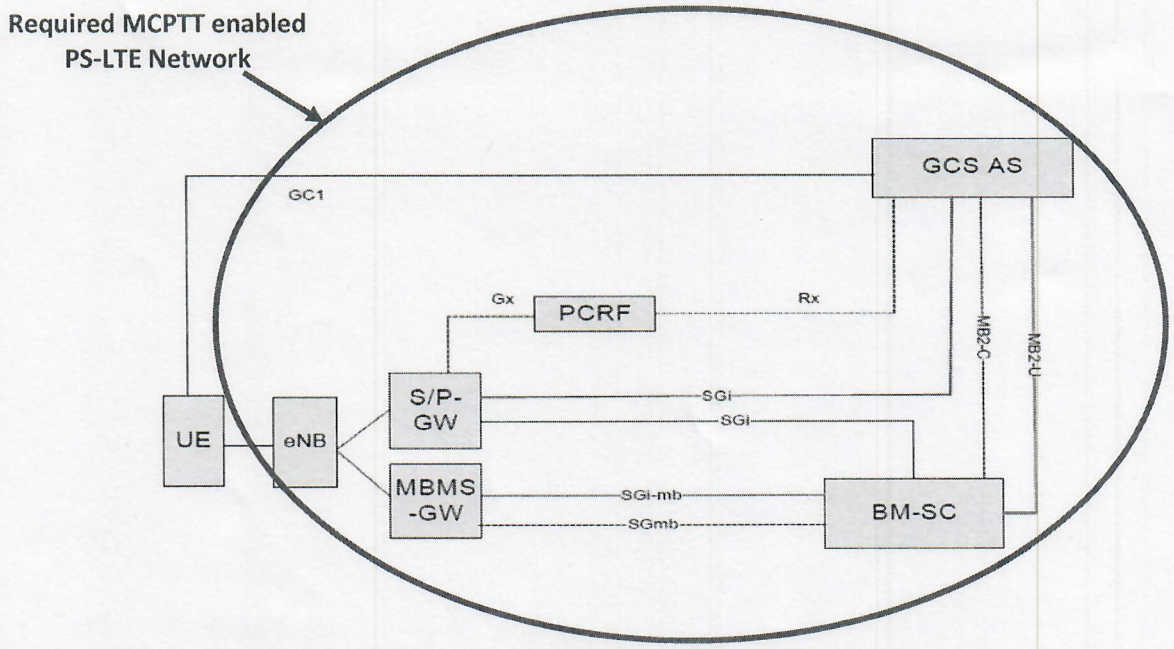
Annexure D

Basic Requirement as per 3GPP PS-LTE Network Functional Architecture



MB2-C	: 3GPP TS 29.468
MB2-U	: 3GPP TS 29.468
GC1	: 3GPP TS 23.468
Rx	: 3GPP TS 29.214

UE :	User Equipment
eNB :	Evolved UTRAN Node B
S/P GW	: Switching / Paging Gateway
MBMS GW	: Multimedia Broadcast Multicast Service GW
PCRF :	Policy & Charging Rules Function
BM-SC :	Broadcast Multicast Service Center
GCS AS	: Group Communication System – Application Server

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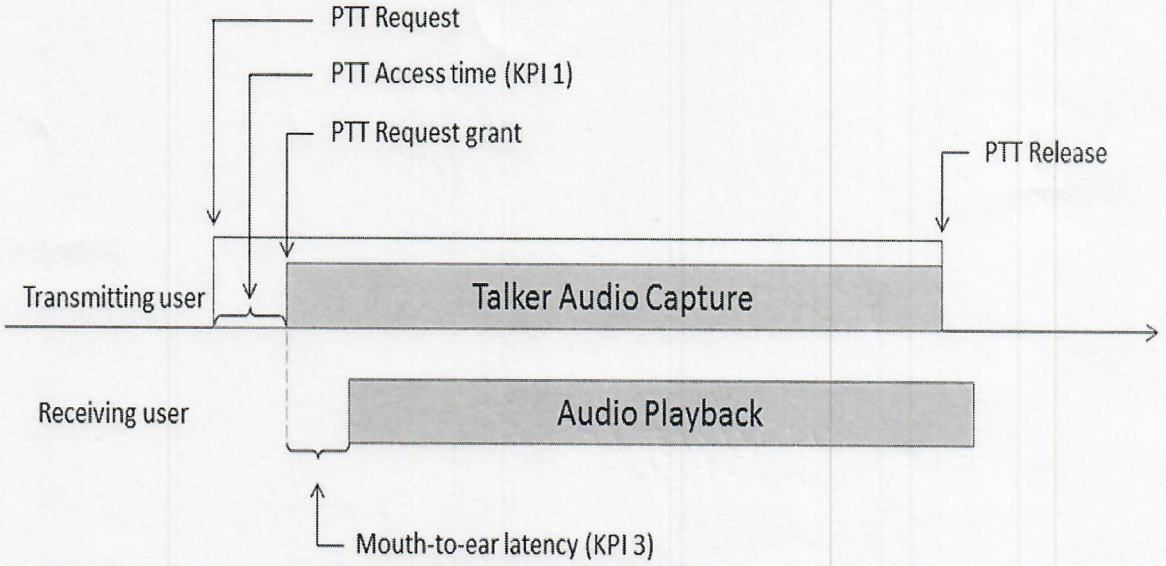
Annexure E

Required Key Performance Indicators (As per 3GPP standards for PS-LTE)

Key Performance Indicator/ Name	Access Time
KPI-1 MCPTT Access Time – Channel Access Time	Less than **300ms**
KPI-3 Mouth to Ear Latency - between utterance of the Tx user and playback of utterance at Rx's user speakers	Less than **300ms**



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Abbreviations:

3GPP- Third Generation Partnership Project

4G – Fourth Generation

BB-PPDR - Broadband Public Protection Disaster Relief Network

BSNL/MTNL – Bharat Sanchar Nigam Limited/Mahanagar Telephone Nigam Limited

BTS – Base Transceiver Station

KPI – Key Performance Indicator

LMR – Land Mobile Radio

LTE – Long Term Evolution

MCPTT – Mission Critical Push to Talk

NDMA – National Disaster Management Authority

OTT – Over-The-Top

POC – Push to Talk Over Cellular

PPDR – Public Protection & Disaster Relief

PS-LTE – Public Safety Long Term Evolution

PTT – Push-To-Talk

Rx – Receive

SIM – Subscriber Identification Module

SLA – Service Layer Agreement

SPV – Special Purpose Vehicle

TSP – Telecom Service Provider

TRAI – Telecom Regulatory Authority of India

Tx - Transmit

VVIP/VIP – Very Very Important person/ Very Important Person

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10/02/2021