CMMI LEVEL 5 | ISO 9001:2008

Response to TRAI Consultation Paper

On

Universal Single Number Based

Integrated Emergency Communication and Response System

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1. **What are the types of emergency services that should be made available through single emergency number?**

It is ideal that all Emergency Services Organisations (Police Services, Fire & Rescue, and Ambulance Services), and other ancillary services (gender based, suicide prevention) and Disaster Management/Response Authorities be made available through the single emergency number. The single emergency number concept has been adopted in other parts of the world to include North America (9-1-1) and the European Union (112).

As shown in the process flow chart cited in the consultation paper, the decision to dispatch appropriate resources should be made by trained professional call takers. Leaving it to citizens to call the correct emergency number is likely to cause slow response times due to confusion with regards to which emergency number to dial. In an emergency, Police, Fire, Medical and Disaster agencies will often have to coordinate a response and having a single number for the citizens would make the response very fast.

A number of emergency situations demand more than one emergency service. For example, a car accident could require Police and Medical Services to respond, or a car accident where the car caught fire would requirethree – Police, Medical and Fire – to respond. In such a situation, a single response number would increase coordination between the Emergency Services allowing for a more precise response. On the other hand, the current situation wherein emergency services operate independently would result in inefficient response efforts that could result in the loss of life and property and further human suffering

OST conducted a Feasibility Study for the Ministry of Home Affairs (MHA) to determine whether an Integrated Emergency Communications Response System (IECRS) could be implemented in the Greater Hyderabad Region, and if so, to determine what it would take to implement such a system while considering all possible related aspects. This study was commissioned by BPR&D under the Micro Mission:04 group (MM:04) which established the “Dial 100, Anytime Anywhere Policing” vision.

The study included the integration of Police, Fire, Medical and Disaster into a single number including a detailed conceptual,operational and network architecture. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy. We would also be happy to make a presentation for our IECRS solution to TRAI.

2. **What universal number (e.g. 100, 108, etc) should be assigned for the integrated emergency communication and response system in India?**

Dial 100 is the best option for a universal number for the Integrated Emergency Communication and Response System in India for a number of reasons:

- Dial 100 is one number that is widely known across PAN Indiaregardless of state boundaries. Further, it is known by people from all age groups, which makes outreach/education programs regarding the universal single number more effective.
- It would be cost-effective to leverage an already existing number as opposed to creating a new number or using a less established option. With a process for Dial 100 already in place, it will also be easier for telecom providers to program switches and coordinate with BSNL on forwarding calls to the correct PSAP for call taking and triaging the emergency.
- Lastly, the Ministry of Home Affairs (MHA) has already moved towards the modernisation of Dial 100 by establishing the Micro Mission:04 group (MM:04) under the Bureau of Police Research & Development (BPR&D), which leads efforts towards achieving the "Dial 100, Anytime Anywhere Policing" vision. Picking a different number after significant investments in Dial 100 would be wasteful.

3. **Should there be primary/secondary access numbers defined for the integrated emergency communication and response system in India? If yes, what should these numbers be?**

After an established transition period, and a comprehensive public awareness campaign, Dial 100 should be the only number defined for emergency service. In the interim defined transition period,all currently existing numbers should be within the system and calls made to the numbers should be forwarded to the universal number chosen. This interim list of numbers is long and includes 100, 101, 102, 103, 104, 108, 112, local numbers, etc. Calls made to these numbers can be forwarded to Dial 100 PSAPs and these interim number lists can be tailored based on the geographic location.

4. **For implementing single number based Integrated Emergency Communication and Response System in India, should the database with information of telephone users be maintained by the individual service providers or should there be a centralized database?**

The database that stores the information of telephone users should be maintained in a centralised location and managed by a third party as per international best practices because:

- This makes the data more dependable.
- It ensures standard quality control over maintenance of data and guarantees regular updating of the database.

- The data will be recorded in a standardised format ensuring that IECRS is an interoperable and integrated system.

5. In case of centralized database which agency (one of the designated telecom service provider, a Central Government department or a designated third party) should be responsible for maintaining the database?

Due to the number of stakeholders involved, the database should be maintained by an independent third party where accountability for database maintenance lies. This third party will be responsible for maintaining the database on a continuous basis to provide up-to-date information to emergency communications centres.

6. What are the technical issues involved in transfer of location of a mobile user in real time?

With the implementation of the proper network and systems, there are no unresolvable technical issues involved in the transfer of location information of mobile users in real time. This process is well established in North America and the European Union, and has been used successfully for over 20 years.

The location accuracy required for IECRS should not be confused with the strict accuracy requirements that have been established for security related concerns that were established in 2011 by TRAI.It has been shown in North America that accuracy requirements of between50-300 meters, depending on location, is more than adequate for emergency 100 services and can easily be met with established and reliable location solutions/services in the current market.Location Based Emergency Services are a part of the OST IECRS solution and have been previously been presented to TRAI.

7. What accuracy should be mandated for the location information to be provided by the mobile service provider?

This mandate should be implemented in two phases:

1. For all emergency calls; and
2. For all other calls.

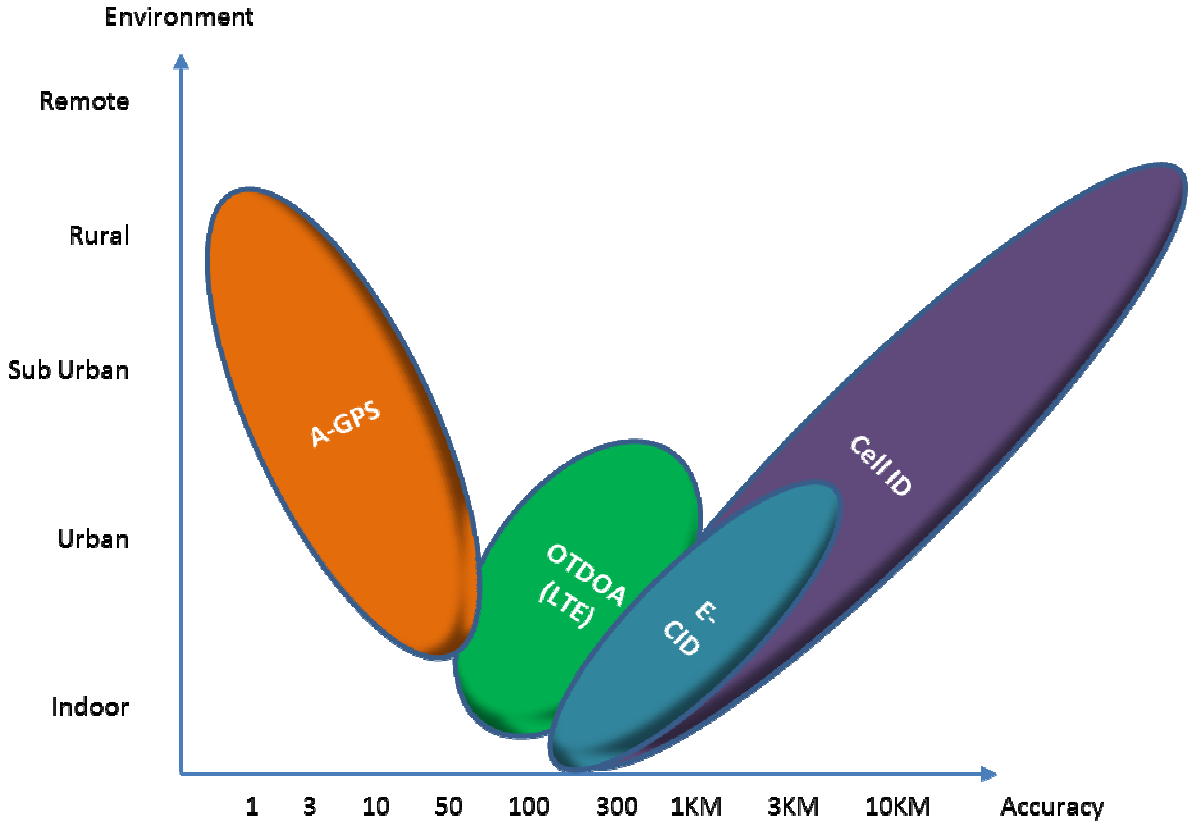
The OST solution is optimised for ALL EMERGENCY CALLS (phase 1). Phase one (1) is an economical solution and it can be implemented in a short time (months).For Phase two the solution will cost a lot (1000's of crores) and will take years to implement.

Without the availability of GPS in the mobile handsets, accuracy levels of between 100-300 meters is more than adequate for emergency services and cost effective solutions are readily and currently available. With the implementation or mandate of GPS enabled handsets those levels could be greatly increased.The higher accuracy levels currently prescribed in the DoT mandate for security services is not feasible within current technologies, and is not required for IECRS.

Mobile phone location information is gathered via a variety of technologies including:

- Assisted GPS (A-GPS)
- OTDOA – Observed Time Difference of Arrival
- Cell ID

These different technologies have varying levels of accuracy depending on the type of location. This is shown in the figure below:



Accuracy of Positioning Methods

The primary method of getting location information for non-GPS devices is triangulation with the use of cell towers. In rural and remote areas, this is sometimes not possible due to the lack of infrastructure. Given the current trends in device upgrades vis-à-vis prices it would be better to wait for an increase in GPS device availability to mandate accuracy requirements for users in rural or remote areas.

8. Should emergency number access be allowed from inactive SIMs or handsets without SIMs? Please justify your answer.

This is a regulatory issue that must be resolved by TRAI. Based upon international standards along with the reasons stated in the consultation paper, specifically the difficulty in getting location information and a potential increase in hoax calls, emergency number access should not be allowed from handsets without SIMs. In the case of handsets with inactive SIMs, there is international experience with the distribution of inactive phones, with continued emergency communications

capability to vulnerable populations (abused women in women's shelters, for example), and this norms applicability could be reviewed for India.

9. Should emergency access be allowed through SMS or email or data based calls? If yes, what will be the challenges in its implementation?

The latest technology refresh coming to developed countries is addressing these needs. In North America and the European Union, the Next Generation emergency telecommunications technology will have the functionality for text, video and other data to be delivered with emergency calls over an IP based public safety communications network, and should be included as a part of the IECRS infrastructure.

10. Is it technically possible to get Location information in case of SMS or data based calls on real time basis? If yes, please elaborate the process and technical challenges if any.

At the moment, there are only two methods for obtaining Location Information in the case of SMS or data based calls on a real-time basis:

- The caller self-reports, i.e. he/she submits the information via SMS or data while reporting the emergency.
- The Telecom Service Providers or a central authority maintains a database as in the case of fixed line calls. However, this method has a similar limitation wherein location data is limited to the address associated with the number in the database and relies on the continued upkeep of this data to assure it is accurate and reliable.

11. How to build redundancy in operations of Centralized response centers or PSAPs as they may be vulnerable to attack – both Physical and Application software related (Virus, Malware, denial of service, hacking) or to Network failures or Congestion i.e. Call Overload?

Centralised response centres or PSAPs form the backbone of the Integrated Emergency Communications and Response System, and hence the backbone of a city/state's emergency infrastructure. This makes them strategically vital security assets that must be functional 24x7x365. All centres must be designed and constructed to provide redundancy for all electrical, HVAC, and communications systems to include mirrored PSAP facilities that can receive and process calls for assistance, and dispatch first responder units to incidents. In addition, the centresmust have a Continuity of Operations Plan (COOP) for continuing operations during power outages and other system failures. These plans could include an emergency operating plan wherein all systems are backed up offsite in case a physical, software related, network related or any other type of event interrupts the regular functioning of the centre.

OST conducted a Feasibility Study for the MHA. The purpose was to determine whether an IECRS system could be implemented in the Greater Hyderabad Region, and if so to determine what it would take to implement such a system while

considering all possible related aspects. The study included detailed architecture for creating such a redundancy operation. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy. We would also be happy to make a presentation detailing our IECRS solution to TRAI.

12. Should all the calls made to universal emergency number be prioritized over normal calls? Please justify your answer.

All calls made to the universal emergency number must be prioritised over normal calls because this number is used in the time of an emergency where minimising the loss of life and property is critical. For this to work, the calls must get through to the emergency number at the earliest. Priority calling is important in particular when there is an emergency of large scale and there are a large number of calls made by the public. Such large call volumes often cause network congestion and often render the emergency number unreachable and unusable.

OST's Feasibility Study conducted for the MHA was undertaken to determine whether an IECRS system could be implemented in the Greater Hyderabad Region, and if so, what it would take to implement such a system while considering all possible related aspects. This included architecture for the provision of a dedicated Public Safety Network for all voice, data and video communications. Such architecture can be tailored for implementation in any mega city in India. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy. We would also be happy to make a presentation detailing our IECRS solution to TRAI.

13. What legal/penal provisions should be made to deal with the problem of Hoax or fake calls to emergency numbers?

The issue of hoax or fake calls to emergency numbers has to be approached with multiple solutions as there is no one solution for it. Threat of legal action ALONE does not provide enough of a deterrent to reduce fake calls. Taking such action would also pose an undue burden on the legal system which is already stretched very thin. Even though legal action works all over the world, in India it would be hard to enforce. This problem must be addressed through a widespread public education program that emphasises the important role Dial 100 plays in saving lives. Other important approaches using algorithms to isolate hoax callers and issue warnings against them would also lead to a reduction in such calls.

The Feasibility Study OST conducted for MHA with regards to implementation of IECRS in the Greater Hyderabad Region identifies hoax calls as a risk that must be mitigated by the system and provides more details regarding the solution to this problem. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy. We would also be happy to make a presentation detailing our IECRS solution to TRAI.

14. How should the funding requirement be met for costs involved in implementation of IECRS? Should the cost be entirely borne by Central/State Governments or are there other possible ways to meet the funding requirements?

The cost of implementing such a solution is in the 1000s of crores. The Feasibility Study OST conducted for the MHA with regards to the implementation of IECRS in the Greater Hyderabad Region examines various financing alternatives including:

- Direct acquisition by the MHA using budget funds
- Using existing donor agency programs
- Establishing a Public Private Partnership (PPP) between the Government and a consortium of private investors and solution providers

Due to the size, complexity, and expense of an IECRS, a PPP structure was suggested. This approach mitigates the implementation risks which are largely assigned to the private party. In terms of financial sustainability, there are alternate revenue streams that need to be examined. These include an examination of the use of the Universal Service Obligation (USO) fund, the targeting of existing tax revenue, and the establishment of usage fees on telephone lines dedicated solely for the sustainment of the IECRS solutions.

The Feasibility Study that OST conducted for MHA with regards to implementation of IECRS in the Greater Hyderabad Region provides a detailed accounting of the components and the funding requirements of this system. It also outlines the PPP approach that we recommend. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy. We would also be happy to make a presentation detailing our IECRS solution to TRAI.

15. Should Key Performance Indicators (KPIs) related to response time be mandated for PSAPs? If yes, what should be the KPIs? Please justify your suggestions.

OST believes it is necessary to mandate Key Performance Indicators (KPIs) for Public Safety Answering Points. KPIs achieve a number of things:

- They provide a clear metric for ensuring PSAP performance.
- They establish Service Level Standards that ensure a nation-wide quality of public safety communication.
- Along with standards, centres must establish Service Level Objectives (SLOs). Subsequently, each centre can measure weekly, monthly and annual KPIs, and report progress towards the established objective.

There are many indicators that can be used as KPIs. They should be developed at the centre, functional and individual level. Below is a list of a few:

- Speed to answer calls to 100 (90% of calls answered within 10 seconds)
- % of calls abandoned

- Call taker utilisation

OST conducted a Feasibility Study for the Ministry of Home Affairs. The purpose was to determine whether an IECRS system could be implemented in the Greater Hyderabad Region, and if so to determine what it would take to implement such a system while considering all possible related aspects. The study outlines OST's conceptual design for the system including the methods to tailor KPIs based on the city in which the PSAP is operating. For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST can provide TRAI with a copy. OST can also make a presentation detailing its IECRS solution to TRAI.

16. Should use of language translation services be mandated for PSAPs?

With 22 official languages and a number of other languages spoken, there is a risk associated with language diversity. To mitigate this risk, it is necessary to follow international best practices and use language translation service mandates for all PSAPs. Both hiring considerations and subscriptions to language line translation services should be considered for PSAPs.

17. In your opinion, what issues related to interconnectivity and Interconnection Usage Charges (IUC) may come up in implementation of IECRS in India? What are the suggested approaches to deal with them?

International best practices should be used to define the requirements for the transparent selection of Service Providers that will provide interconnectivity of PSAPs. This can be done through an open competition/tendering process. Once providers are chosen other service providers will pay the designated operator an Interconnection Usage Charge (IUC) decided during the selection process.

18. Should a separate emergency number for differently able persons be mandated in India? How the use of this number be administered?

No, Dial 100 should be the only number established to report emergencies and should be accessible to all persons, where feasible, regardless of abilities. In addition, all emergency call takers should receive adequate training to handle calls from differently abled persons.

19. In your opinion, apart from the issues discussed in this consultation paper, are there any other technical, commercial or regulatory issues that may be involved in implementation of IECRS in India? Please elaborate.

OST conducted a Feasibility Study for the Ministry of Home Affairs. Its purpose was to determine whether an IECRS system could be implemented in the Greater Hyderabad Region, and if so to determine what it would take to implement such a system while considering all possible related aspects. This involved considering the technical, commercial and regulatory issues involved in the implementation of IECRS and the issues identified in this study can be applied to other parts of India.For more information, a copy of this study (over 350 pages in length) can be obtained from BPR&D, MHA or OST would be happy to provide TRAI with a copy.

We would also be happy to make a presentation detailing our IECRS solution to TRAI.