INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

Response to TRAI Consultation Paper

Telecom network failures during Emergencies/Disasters –

Priority routing of calls of persons

Engaged in 'response and recovery'

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Responses to issues raised in the consultation paper

Responses to Issues on Model B

4.9 In the suggested approach there are following issues involved:

4.9.1 *MVNO is yet to be introduced in Indian Telecom Market by the Government. Even if the MVNO concept is implemented for the limited purpose of introducing priority call routing during emergencies/disasters, then also for implementation in India, telecom operators should have technically compatible equipments in place to enable the Virtual Operator infrastructure concept.*

Our Response:

While single part MVNOs exist in the India telecom market, as per TRAIs recommendation dated 6th August 2008, Multi operator MVNO as envisaged in this scheme is a regulatory issue and within the purview of TRAI. Current technology easily allows for Multi Mobile Network Operator MVNO and it is just a matter of configuration. Multi-operator MVNO can be permitted only for emergency conditions or otherwise and this is up to regulator.

4.9.2 *The emergency response group subscribers should be given a special SIM and this group should be identified/approved by the appropriate government body.*

Our Response:

This can be decided by the appropriate government body that is responsible for emergency response and rescue operations such as Ministry of Home Affairs or National Disaster Management Authority etc. The special SIM cards of the said MVNO can be provided as per the recommendations to the agencies and personnel identified by the said government body.

4.9.3 *An executive team for set-up of the Emergency-MVNO should be established. This executive team should consist of government officials and members from each operator.*

Our Response:

Such a team would be required for any of the methods which would interact between the government agencies and operators and act as a translator for the chain of events under emergency conditions.

4.9.4 *The network security considerations would be required to be appropriately handled.*

Our Response:

There are no special network security considerations due to implementation of eMVNO. The network security considerations cited are similar to those that will exist for any mobile network.

Efficient handling of equipments and SIM distribution will prevent any threats by use of this method.

5.2   In your opinion, which of the three possibilities as discussed in Chapter IV i.e. (a) Solutions based on combination of MTPAS of UK and GETS of US (b) Solution based on MVNO concept (c) Solution based on eMLPP would be best suited for implementation in India and Why? In case there is any other methodology that is suggested, the details of the same may be provided?

<u>Our Response</u>:

In the Indian scenario, where subscriber density is very high, it is very difficult to ensure a congestion free wireless network in the case of emergencies without having dedicated resource reservation on the access network. Reserving resources may not be possible at all times without a) increasing operational cost of operators for worst case provisioning, or b) affecting civilian users.

Based on the technology options available till date, we present our opinion on various schemes described in the consultation paper.

Model A

The consultation paper merely suggests that a combination of MTPAS and GETS will be a better approach. But, the paper is silent on how this combination of MTPAS and GETS will be achieved. MTPAS system completely disables civilian access to the network during high emergency situations, and hence decongesting the network. GETS with WPS tries to provide priority to rescue users without any effect on civilian users.

Implementation scheme involving best features of MTPAS and GETS will first need to be worked out with full details at protocol level. Moreover, some of the implementation mechanics may not be supported by installed base of network equipment.

Currently, Model A as suggested by TRAI seems incomplete and therefore it is difficult to comment on the specific mechanics.

Model C

eMLPP can work at the highest priority only within *one operator's network* and will not work across operators' network. Consider a scenario where a given area (where disaster has occurred) is served by multiple operators. If operator A's infrastructure is facing technical downtime or is affected by the disaster, the emergency personnel who are subscribers of

operator A may face difficulty in completing the call (despite eMLPP). In this area, if another operator B's network is up and not affected by the disaster, even then the emergency personnel will not be able to take advantage of this network.

Model B

This solution can work across multiple operators and enable emergency personnel to have a seamless conversation even if the home network infrastructure is affected by the disaster. The emergency personnel will have access to the network as long as there is at-least one operator whose network is up.

The method does not require any support from the base station / network infrastructure once the initial setup and configuration is completed. The capabilities of Model B can be further enhanced significantly by implementing eMLPP in operator's network. Implementation of eMLPP along with the eMVNO will improve the overall capability. As a result, the scheme can be implemented across multiple operators and multiple technologies. Emergency MVNO can be a government body, at-least under direct government control - as this will enable complete control of the system during national emergencies.

An overview of the advantages and disadvantages of different models proposed is given below:

Parameter	*Model A* (MTPAS + GETS)	*Model B* (MVNO)	*Model C* (eMLPP)	*Model B+C* (MVNO + eMLPP)
Communication works in case of damage to one operator	?	✓	✗	✓
Priority access in queuing	?	✗	✓	✓
Works without intra-circle roaming	?	✓ *(implicit)*	✗	✓ *(implicit)*
Pool available free resources from any operator	?	✓	✗	✓
Centralized registry of all high priority subscribers	?	✓	*operator specific*	✓
No Inconvenience to civilian users	✗	✓	✓	✓

Legend:

✓   *Indicates the proposed method supports the parameter/ feature*

✗   *Indicates the proposed method does not support the parameter/ feature*

?   *Insufficient details to argue merits or demerits of the model*

Any eMVNO based solution will ensure that Emergency Response Team will be within communication reach of each other irrespective of their home operators.

Summary:

We opine that Model B based on MVNO based solution would work well for most situations. A combined system leveraging eMLPP + eMVNO would be even more efficient for the required purpose and would be best suited for implementation in India as is evident from the above table.