



**Telecom Regulatory Authority of India**



Response to reference received from the Department of Telecommunication  
on TRAI's recommendations dated 26<sup>th</sup> November 2013

**on**

**"Telecom Network Failures during Emergencies/ Disasters- Priority  
routing of calls of persons engaged in 'response and recovery'**

**New Delhi, 8<sup>th</sup> April, 2015**

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## **CHAPTER- I**

### **INTRODUCTION**

1. It has been observed that major disasters are immediately followed by an intense burst in telecom traffic which can congest networks resulting in call-blockages and lost-messages. Most networks are engineered for peak load at levels well beneath the demands placed on them during disasters because of the cost factors involved. During such times mostly the loss of infrastructure results in network congestion which can lead to failure of network elements.
2. The role of personnel involved in the rescue and relief operations is very critical during emergencies. Therefore, a system needs to be devised to facilitate such a mechanism which gives priority to these personnel on communication networks during emergencies.
3. Under section 11(1)(a) (iv) of TRAI Act 1997 (as amended), Telecom Regulatory Authority of India (TRAI) is entrusted with the responsibility of promoting efficiency in the operations of telecommunication services so as to facilitate growth in such services. Further, under section 11(1)(a) (vii) of TRAI Act 1997 (as amended), TRAI can make recommendations on any matter related to telecommunication industry in general. In the aforesaid background, the Authority *suo motu* sent its recommendations on 'Telecom Network Failures during Emergencies/Disasters-Priority routing of calls of persons engaged in response and recovery' dated 26.11.2013 to the Department of Telecommunications (DoT) after due consultation process.
4. The DoT vide its letter dated 10.11.2014 informed the Authority that a committee was constituted in the DoT to examine the recommendations of the Authority. The said committee in its report, submitted on

06.08.2014, commented on the recommendations of the Authority. The DoT has sought TRAI's comments/views on the said committee report.

5. The committee in its report referred to another report of a committee which was constituted separately by the DoT on 16.05.2013 for implementation of 'Priority and Secure Calling'. This committee recommended a technical model for implementation of "Priority & secure calling using Gateway Core Network (GWCN) & Multi-operator Core Network (MOCN)". Further, a reference was also made about Ministry of Home Affairs(MHA) note dated 07.10.2014 in the committee report dated 06.08.2014. As the committee report of 16.05.2013 and MHA note were not sent along with the DoT's letter dated 10.11.2014, it was requested to provide a copy of the same. In response, the DoT vide its letter dated 22.12.2014 provided a copy of an internal note of the DoT containing some information from the committee's (dated 16.05.2013) recommendations. The Authority decided to respond based on the information available in the documents supplied.
6. The DoT's committee on technical model for implementation of "Priority & secure calling using Gateway Core Network (GWCN) & Multi-operator Core Network (MOCN)" has envisaged that the arrangement of Priority & secure calling should be completed in three phases. In Phase-I, Telecom Service Providers(TSPs) starting with BSNL/MTNL should provide priority treatment of call sessions and data transfer to the special subscribers requiring priority treatment. In phase-II and phase- III, the committee envisaged that the DoT should install its own networks to fulfill the priority needs and have secure calling and to take care of requirements of Defence Research and Development Organisation(DRDO). Further, as per the DoT committee's report(dated 06.08.2014), the recommendations of committee on technical model for implementation of 'Priority & secure calling using Gateway Core Network (GWCN) & Multi-operator Core Network (MOCN)' has already been approved by the DoT. (as mentioned in para 5 of the reference back from DoT).



7. The committee's report(dated 06.08.2014) forwarded by the DoT for the Authority's comments seems has inter-mixed the Authority's recommendations with the above DoT's committee(on technical model for implementation of 'Priority & secure calling using Gateway Core Network (GWCN) & Multi-operator Core Network (MOCN)') and have given its recommendations. In view of these facts, the Authority is limiting its response solely to its recommendations. The Authority has not examined phase-II and phase-III implementation suggested by the DoT.

8. The solution recommended by the Authority in its recommendations dated 26.11.2013 was based on the following broad principles:

- (i) Simple and minimum network upgradation should be required for implementing the PCR solution.
- (ii) The solution should be Cost effective, efficient and should take minimum time for implementation.
- (iii) The PCR solution should be able to be implemented in multi-operator networks so that in case one TSPs network is failed, option should be available to use other TSP's available network.
- (iv) CAPEX and OPEX for the implementation will have to be borne by the Government as it is the requirement of the Government to use TSPs network at the time of disasters/ emergencies for the persons involved in rescue and relief operations and for the relevant authorities to be able to contact these persons in such situations.

9. The Authority's recommendations, DoT's view and the Authority's response are given in **Chapter-II**.

## **CHAPTER- II**

### **Response to the DoT views**

#### **1. Para 4.1**

The Authority recommends that a priority call routing scheme should be instituted to ensure that calls of personnel responsible for 'response and recovery' during disasters are routed on priority. (Para 1.20)

#### **Para 4.2**

The Authority recommends that the eMLPP based priority call routing (PCR) should be implemented in wireless networks in India along with the right to pre-empt ongoing calls, if needed. The use of call pre-emption feature of eMLPP may be reviewed subsequently, based on the performance of the PCR scheme during emergencies. (Para 2.24)

#### **DoT view**

TRAI recommendation may be accepted for priority call routing as a concept. Telecom network comprises of CS (Circuit Switched) and PS (Packet Switched) domain therefore PCR implementation to be considered in both CS & PS domain.

Telecom network comprises of Circuit-Switched (CS) domain and Packet-Switched (PS) Domain. TRAI recommendation of PCR based on eMLPP or its equivalent CDMA implementation is applicable technically only for CS domain i.e. all TDM based wireless networks (2G: GSM, CDMA) and only CS domain of 3G networks (excluding PS domain). Thus it does not cover all existing wireless networks e.g. PS domain of 3G, LTE etc.

PCR in case of PS domain of 3G/UMTS, LTE, LTE, LTE-Advanced networks etc., need to be implemented on basis of QoS.

PCR of Emergency Call and Multi-Media communication using IP-Multi-Media Sub-System (IMS) and enhanced Multi-Media Priority (eMPS) Service in PS domain need to be included.

PCR on eMLPP in CS domain and QoS based in PS domain may be implemented initially with priority subscribers owned by respective TSPs and having intra-circle & inter-circle roaming arrangements for these subscribers. Later, these subscriptions of priority subscribers may be migrated to separate core network i.e. Gateway Core Network (GWCN)/ Multi-operator Core Network (MOCN) in a phased manner.

PCR may be successful only when traffic of normal users to network in disaster/emergency situations are contained using load control, access control, management etc. and mechanism in place for PCR can act effectively. Pre-requisite for PCR is availability of working network and dropping of messages related to PCR does not take place on lower layers of stack, where user based priority is not considered. Along-with PCR, load control, access control, traffic management, capacity enhancement techniques etc. need to be considered.

In view of above, following is recommended:

PCR may be implemented in two phases, based upon eMLPP for CS domain and QoS for PS domain.

- i. **Phase-I:** Priority Subscribers owned by respective TSPs and intra-circle, inter-circle roaming agreements in place. Procedures for load control, admission control etc. also required to be stipulated. Testing & Field-trial required to be conducted and Standard operating procedure (SOP) for TSPs is required to be finalized by TEC or any entity authorized by DoT before implementing in the networks.
- ii. **Phase-II:** Implementation of separate core network i.e. GWCN/MOCN and priority subscriber owned by this network, Roaming, agreements of GWCN/MOCN with all TSPs. Testing & Field-trial required to be conducted and Standard operating



procedure (SOP) for TSPs is required to be finalized by TEC or any entity authorized by AoT before implementing in the networks.

### **Response of TRAI**

During emergencies, primary requirement for the persons involved in the rescue and relief operations is of voice communication for effective coordination so that relief to the victims can be provided at the earliest. In most of the countries, where such mechanism is in place, PCR system is based on Circuit switch (CS) only. As and when systems, which are Packet Switch (PS) type, are available the priority mechanism will be built in those systems. As mentioned in Chapter-I, the requirement of communication for the rescue and relief team is of urgent nature and the Authority's focus in its recommendations was to utilise the available infrastructure quickly and in cost effective manner, PS domain system did not form part of the Recommendations.

The Authority has not examined phase-II and phase-III approach suggested by the DoT which envisages Government as a telecom service provider. Such an arrangement will not only incur significant expenditure on equipments and other infrastructure but also will take years to develop. Accordingly, the Authority reiterates its recommendation.

### **2. Para 4.3**

The Authority recommends that priority call routing scheme should be funded and overseen by the Government. (para 2.29)

### **DoT view**

TRAI recommendation may be accepted partly. Only cost involved in setting-up of the separate networks and associated expenses, which is not part of the TSP's networks should be funded and overseen by the Government.



There is no cost involved on government for implementing PCR in networks in phase-I. TSPs need to upgrade and provide necessary configurations, provisioning, connectivity and roaming arrangements as per license conditions and no cost is to be incurred by government on part of this. In phase-II, cost (CAPEX & OPEX) is involved on government side and necessary provisions in this regard are to be made.

Provisions of funds for R&D, indigenous solutions, innovations, programmes, projects, participation in conferences, international standardization bodies, spectrum etc. which are related to emergency telecommunications to be made.

Details of various cost factors involved in implementation of PCR in network are mentioned in para-7(of the committee's report).

### **Response of TRAI**

The service providers design their networks based on traffic and commercial considerations. Normally, they do not take into account the situation wherein they need to provide priority to a few of their subscribers who are involved in rescue and relief operations. Though, the switches of most of the telecom service providers may be eMLPP compliant, the features to provide priority need to be invoked which may involve expenditure towards their vendors. In addition, a mechanism needs to be built for service delivery to the subscribers requiring priority. These arrangements will certainly incur some expenditure in terms of capital and operational expenditure. The Authority is of the opinion that provision for priority call routing for the persons involved in the rescue and relief operations is the requirement of Government and not of the TSPs. Therefore, the expenditure(s), if any, should be borne by the Government. As the amount of expenditure is unknown at present, the Authority recommended for a pilot project to assess the expenditure(CAPEX and OPEX)and operational challenges such as interoperability issues, signaling channel overload, delivery mechanism, etc.

The Authority is apprehensive that non-reimbursement of expenditure may result in non-starter of the PCR services in the country. Therefore, the Authority reiterates its recommendation.

It is mentioned that phase-II and phase-III approaches suggested by the DoT has not been examined by the Authority.

### **3. Para 4.4**

A Steering Committee comprising of senior officers from TRAI, Telecom Engineering Centre (TEC), Department of Telecommunications (DoT), National Disaster Management Authority (NDMA) and Ministry of Home Affairs (MHA) may be constituted to steer the pilot. (Para 2.31)

#### **DoT view**

TRAI recommendations may be accepted to form the steering Committee for pilot project. However steering Committee may be formed under chairmanship of Sr.DDG, TEC and taking representatives from DoT, NDMA, MHA. Committee can deliberate with various stakeholders e.g. TSPs, manufacturers and any other relevant organizations. Scope of Committee may be to oversee activities related to testing, field trial & finalisation of SOP based upon eMLPP in CS domain and QoS based implementation in PS domain.

#### **Response of TRAI**

As mentioned in response to Para 4.4 above, a pilot project is needed to be done using the existing infrastructure of the TSPs. As the cost estimations will be done to determine not only funding of the PCR scheme but also to determine the tariff for subscribers who will be provided PCR facility. As determination of tariff is in exclusive domain of TRAI, one member from TRAI has to be a part of the Steering Committee. Accordingly, the Authority reiterates its recommendation.

#### **4. Para 4.5**

The Authority recommends that Approach 'B' as mentioned in Para 2.31 be adopted to arrive at the costs involved in implementation of PCR for each telecom service provider. On successful implementation of PCR across the entire network, the operators will file for reimbursement of their costs (Para 2.32)

#### **DoT view**

TRAI recommendation may be accepted for arriving at cost involved, however it should include various types of costs involved during Phase-II & Phase-III.

Costs factors involved are mentioned in Para 7(of the committee report). Government may enforce through relevant clauses of license conditions to implement PCR by TSPs in their networks and no cost against CAPEX/OPEX need to be reimbursed to TSPs by government.

#### **Response of TRAI**

The Authority recommended 'Approach B' for determining the costs involved in implementing PCR in India by implementing a pilot project. In this approach, one of the Licensed Service Areas (LSA) can be chosen to implement PCR based on eMLPP on a pilot basis. The PCR will be implemented across all operators' network in this area. The LSA chosen for PCR implementation should be small in terms of subscribers and yet all major TSPs should be operating in it. Since number of mobile connections will be comparatively small, the network elements that would require up-gradation for implementing eMLPP would be limited and cost of the pilot would be lower and analysis of the results would be easy.

Further, the Authority has recommended that on successful implementation of PCR across the entire network, the costs incurred by



the TSPs may be reimbursed. The Authority does not agree with the conclusion of the DoT's committee that no cost against CAPEX/OPEX needs to be reimbursed to the TSPs by the Government. As mentioned earlier, the Authority is apprehensive that non-reimbursement of expenditure may result in non-starter of the PCR services in the country. Therefore, the Authority reiterates its recommendation.

It is mentioned that phase-II and phase-III approaches suggested by the DoT has not been examined by the Authority.

#### **5. Para 4.6**

The Authority recommends that the capital expenditure for PCR scheme implementation should be funded by Government through budgetary allocation/support. (Para 2.34)

##### **DoT view**

TRAI Recommendation may be accepted Funds for relevant CAPEX mentioned against Para 4.3 (item No. 3 of the table) may be funded by Government through budgetary allocations/support.

##### **Response of TRAI**

It is mentioned that phase-II and phase-III approaches suggested by the DoT has not been examined by the Authority. In view of response given for para 4.3 and 4.5 above, the Authority reiterates its recommendation.

#### **6. Para 4.7**

The Authority recommends that operational expenses for PCR scheme should be borne by National Disaster Relief Funds (NDRF)/SDRF. (Para 2.36)

##### **DoT view**

NDRF/SDRF may have difficulty in seeking funds for Operational Expenditure of PCR service. The Committee recommends that the Operational Expenditure may be borne by MHA/Government; as such a



move will ensure continual engagement/Commitment of MHA in maintenance of PCR service and further development as per need from time to time.

### **Response of TRAI**

The Authority, in its recommendations had stated that as per clause 46 of Chapter-IX of the Disaster Management Act 2005, National Disaster Response Fund has been created which is to be used for meeting any threatening disaster situation and it shall be made available towards meeting expenses for emergency response. Therefore the Authority is of the opinion that this fund may be utilised for meeting operational expenses of PCR scheme. NDMA, which comes under MHA, has also suggested that operational expenses for PCR scheme should be borne by National Disaster Relief Funds(NDRF)/State Disaster Relief Fund(SDRF). Accordingly, the Authority made the recommendation.

The DoT has sent a copy of the MHA's letter dated 25.09.2014 wherein the MHA has not agreed to bear the Operational Expenditure of PCR scheme of DoT (which may be including phase -II and Phase-III expenditure also). In the PCR scheme, suggested by the Authority, the operational expenditure may not be large enough and therefore can be borne by the SDRF and NDRF. Accordingly, the Authority reiterates its recommendation.

### **7. Para 4.8**

The Authority recommends that the issue of charging for PCR services will be decided after getting the data on cost incurred for providing the service. (Para 2.41)

### **DoT view**

TRAI recommendation may be accepted.

### **Response of TRAI**

Agreed only for implementation of the PCR scheme suggested by the Authority.

## **8. Para 4.9**

The Authority recommends that the Steering Committee suggested for establishment as per para 2.31 may deliberate and decide upon the service delivery model for PCR implementation. (Para 2.45)

### **DoT view**

TRAI Recommendation may be accepted by constituting a separate Committee for Service Delivery Model may be finalized by constituting a separate Committee by DoT taking representatives from Licensing Cell of DoT, TERM, TEC, NDMA, MHA etc.

Service delivery model may also include:

- i. Service Delivery Model with GWCN/MOCN may include constitution of team in each LSA by every TSP.
- ii. TERM cells needs to be empowered to issue notifications of emergency/disaster to TSPs in accordance to directions from NDMA, SDMA etc.
- iii. DoT HQ and Concerned TERM needs to authorize to check maximum numbers of Priority subscribers in particular area.

DoT HQ and Concerned TERM cell needs to be authorized to give priority to personnel involved in telecom maintenance and coordination during emergency/disaster.

### **Response of TRAI**

The recommendation of the DoT's committee envisages a separate committee for service delivery model. As mentioned earlier that Phase-II and Phase-III approaches of the DoT have not been examined by the Authority. In view of response given to the para 4.3 and 4.4 above, the Authority reiterates its recommendation.

## **9. Para 4.10**

The Authority recommends that it should be mandatory for all service providers offering priority services to enter into intra-circle roaming

arrangement as per their license conditions for their priority service users and ensure that PCR service are supported through roaming arrangements. (Para 2.46)

### **DoT view**

TRAI Recommendation may be accepted.

Necessary directives against license condition may be issued to TSPs for Phase-I & Phase-II which includes:

- i All TSPs may enter into roaming agreement among themselves for PCR users. TSPs indicated issues in implementing selective roaming arrangements for PCR users in phase-I. The best solution for intra/inter-circle roaming in phase-I implementation needs to be evolved during pilot testing and after discussions with various stakeholders.
- ii Entering into roaming agreements with GWCN network for PCR users
- iii Accounting settlement procedures of CDRs
- iv Allocation of numbering resources to GWCN network

### **Response of TRAI**

As mentioned earlier Phase-II and Phase-III approaches have not been examined by the Authority. Regarding issues in implementation of selective roaming arrangements for PCR users raised by some of the TSPs, it is mentioned that this issue can be examined during pilot study suggested by the Authority. Accordingly, the Authority reiterates its recommendation.



## **10. Para 4.11**

The Authority recommends that a Standing Committee, under the Union Home Secretary, comprising senior officers from DoT, TRAI, NDMA, TEC, and representatives from industry should be formed. This Committee should be responsible for overseeing the policy with respect to Emergence Telecommunications in India in general and the following aspects in particular-[refer para 4.11(i) to(p) below]

### **DoT view**

There is already a Crisis management Plan for Telecommunication Services and Standard Operating Procedures for Telecommunication Services for Responding to Disasters in DoT HQ. DoT is in process of constituting national Telecom Crisis Management Committee (NTCMC) under chairmanship of Secretary (T) as apex body of DoT for dealing with major crisis/emergency/disaster of serious nature.

DoT is also in process of constituting National Telecom Disaster Co-ordination Committee (NTDCC) under chairmanship of Member (T) which would senior officers of DoT and NDMA as member. NTDCC would issue guidelines from time to time as required for effective preparedness and response to disasters.

Moreover, as per Disaster Management Act, 2005, a National Executive Committee (NEC) has already been constituted under chairmanship of Union Home Secretary. Various Secretaries including Secretary (T) are members of NEC. NEC acts as the coordinating and monitoring body for disaster management. NEC may give directions to concerned Ministries/Departments of Central or State Governments and State Authorities regarding measures to be taken by them in response to any specific threatening disaster situation or disaster.

Hence, Standing Committee as recommended by TRAI may not be required.



### **Response of TRAI**

At para 3.12 of its recommendations on the subject the Authority recommended that a holistic approach towards managing telecommunication during emergencies/disasters in India can be adopted in future only when an exclusive setup is created for the same with the responsibility of developing, maintaining and executing the emergency telecommunications plans. As the approach to emergency telecommunication needs to be supported by multiple stakeholders from various government departments and the industry, the Authority opined that there should be Standing Committee to oversee policy for Emergency/Disaster communications in India. Since relief and response operations are handled by the Central and State Governments, such a Committee should be headed by the Union Home Secretary. Therefore, the Authority recommended that a Standing Committee, under the Union Home Secretary, comprising senior officers from DoT, TRAI, NDMA, TEC, and representatives from industry should be formed. However, the Authority has no objection, in case NEC can handle the points mentioned at para 4.11 (i) to (p).

### **11. Para 4.11(i)**

Formulation of National Telecom Emergency Plans

#### **DoT View**

TRAI Recommendation in Formulation of National Telecom Emergency Plans, already covered as ETP in Crisis Management Plan for Telecommunication Services and Standard Operating Procedure (SOP) for Telecommunication Services for responding to Disasters. No action required at this stage.

#### **Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11(j)**

TRAI Recommendation Prescribing sectoral Standard Operating Procedures (SOPs) for effective and early mitigation during disasters and emergencies.

**DoT view**

Already covered in SOP of DoT under process. To be handled by Committees envisaged in SOP of DoT under process. Requirement may be forwarded to concerned unit dealing with SOP & Emergency plan.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11 (k)**

TRAI Recommendation in Capacity building across various government departments, relief and rescue operators and telecom service providers in respect of making the telecom networks resilient to disasters/emergencies

**DoT view**

TRAI Recommendations may be accepted and NTIPRIT or any agency authorized by DoT may be entrusted to carry out following;

- I. Training for Emergency Telecom Plan, PCR, Emergency Number Routing, Restoration, Sharing, temporary capacity and Resilience plan,
- II. To design, develop and deliver certification courses in emergency telecom for Emergency Team of TSPs, DoT officials, other departments/ministries and NGOs,

DoT may issue instructions/directives against license conditions to all TSPs to get trained all identified officers/personnel for handling emergency/disaster in their network in concerned emergency Telecom Courses to be run by NTIPRIT.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11 (l)**

TRAJ recommendation for support to emergency broadcasting, maritime and public safety signals

**DoT view**

To be handled by Committees envisaged in SOP of DoT under process. Requirement may be forwarded to concerned unit dealing with SOP & emergency plan.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11**

TRAJ recommendation for Support and training to Amateur Radio users.

**DoT view**

NTIPRIT or any agency authorized by DoT may be asked to design, develop and deliver courses for training to in Amateur Radio for use in emergency telecom for Emergency Team if TSPs, DoT officials, other departments/ministries and NGOs.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11(n)**

TRAJ Recommendation in Reconstruction – rapidly restore communications capabilities, coordination of relief activities

**DoT view**

TRAI recommendation may be accepted.

To be handled by committees envisaged in SOP of DoT under process. Requirement may be forwarded to concerned unit dealing with SOP & emergency plan.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11 (o)**

Encourage research and development and promote indigenous solutions related to Emergency Telecom by creating a forum of service providers, system suppliers and test equipment vendors.

**DoT view**

TRAI recommendation may be accepted. Provisions of funds for R&D, indigenous solutions, innovations, programs, projects, participation in conferences, international standardization bodies, spectrum etc. which are related to emergency telecommunications are to be made.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

**Para 4.11(p)**

Any other Emergency Telecom related work assigned by the Government.



**DoT view**

TRAI recommendation may be accepted.

**Response of TRAI**

Recommendations of the Authority is reiterated, refer to response to the para 4.11.

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