ETSI TS 102 182 V1.3.1 (2008-02)

Technical Specification

**Emergency Communications (EMTEL);
Requirements for communications from
authorities/organizations to individuals,
groups or the general public during emergencies**

Reference
RTS/EMTEL-00011

Keywords
emergency, administration

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Foreword

This Technical Specification (TS) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

The present document is the third of a set of deliverables covering the communication needs of individuals and authorities in emergency situations, as identified below:

SR 002 180 [5]: "Emergency communications Requirements for communication of citizens with authorities/organizations in case of distress (emergency call handling)";

TS 102 181 [6]: "Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies";

TS 102 182: "Emergency Communications (EMTEL); Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies";

TR 102 410 [13]: "Emergency Communications (EMTEL); Requirements for communications between individuals and to authorities whilst emergencies are in progress".

Introduction

Recent world events have created a heightened social focus on public protection and general public safety. Actions such as the Universal Service Directive requiring the European emergency call number (112) be enhanced with the provision of caller location and the Seveso II Directive aimed at the prevention of major accidents involving dangerous substances highlight this focus. Special consideration may have to be given to the elderly, the disabled and the young people. An annotated bibliography of documents dealing with human factors can be found in SR 001 996 [4].

The provision of effective communication is one of the most important duties of a public authority towards its citizens. An important component required to meet this duty is the ability for Authorities to communicate with citizens during times of emergency. Authorities and emergency response teams need to warn and inform the public in times of crisis and therefore is required to have effective, high quality communication methods and systems to meet this need.

The responsibility for emergency response or disaster-related communications is addressed differently from country to country. In most cases, the parties responsible for warning and informing the public follow the country's administrative structures with coordinators at both the local and national levels, as well as across multiple disciplines and departments.

The present document catalogues the requirements on warning and informing the public as seen by the Emergency Services Community and looks at the technologies and methods available to do this.

1 Scope

The present document gives an overview of the requirements for communication from authorities/organizations to citizens in all types of emergencies. It collects operational and organizational requirements as a basis for a common notification service, including targeting of the area to be notified. Although many of the requirements relate to national public policies and regulation, there are a number of service and technical aspects which are better dealt with on the European level to ensure harmonized access and services over Europe and service effectiveness through increased user awareness by using standardized solutions.

The present document also collects already established requirements for notification and gives guidance on how to find the standardization work published or ongoing. The document identifies the areas needing particular attention from the experts and refers to identified documents in preparation in SDOs.

The present document is a collection of technical requirements and recommendations.

The present document is applicable to ETSI technical bodies for the defining of services and specifying technical solutions.

It is clear that the present document will not present a solution for every scenario.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normatives references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI EN 300 401: "Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers".

[2] ETSI EN 300 468: "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems".

[3] UK Civil Contingency Act 2004, chapter 36, http://www.opsi.gov.uk/acts/acts2004/20040036.htm.

[4] ETSI SR 001 996: "Human Factors (HF); An annotated bibliography of documents dealing with Human Factors and disability".

[5] ETSI SR 002 180: "Emergency communications Requirements for communication of citizens with authorities/organizations in case of distress (emergency call handling)".

[6] ETSI TS 102 181: "Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies".

[7] ITU-T Recommendation E.106: "International Emergency Preference Scheme (IEPS) for disaster relief operations".

[8] ITU-T Recommendation E.105: "International telephone service".

[9] ETSI TS 122 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1 (3GPP TS 22.228)".

[10] ETSI TS 123 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23.228)".

[11] World Telecommunication Development Conference 1994 (WTDC-94): "Resolution No.7 (Disaster Communications)".

[12] ITU-T Recommendation X.1303: "Common alerting protocol (CAP 1.1)".

2.2 Informative references

[13] ETSI TR 102 410: "Emergency Communications (EMTEL); Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress".

[14] ETSI TR 102 444: "Emergency Communications (EMTEL); Analysis of the Short Message Service (SMS) and Cell Broadcast Service (CBS) for Emergency Messaging applications; Emergency Messaging; SMS and CBS".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in SR 002 180 [5] and the following apply:

citizen: any individual (resident, visitor, passer-by), present in the vicinity of an emergency situation (from the first notice till the complete clearance) and subject to be affected by it, but who has no identified role in the actions of rescue and of restoration of normal conditions

NOTE: Depending on his situation, the citizen can send alerts or provide information to the emergency services, but in many cases is either passive or a potential victim.

common emergency communication and information system: system to enable communication and sharing information between the monitoring and information centre and the designated contact points

emergency notification systems: general category for any systems used to notify persons of an emergency

Emergency Telecommunication Service (ETS): service capability that exhibits the following characteristics:

1) ETS is a national implementation utilizing the features facilities and applications available in existing national public networks and service offerings. As such it could be said to resemble a supplementary service since it can only exist if there is an underlying telecommunications service.

2) As a national capability, ETS is specifically designed to serve the telecommunications needs of nationally authorized users. This might include issues such as priority access to telecommunications in a secure mode operation.

3) Nationally authorized ETS users may be given access to TDR facilities for disasters occurring in other countries or indeed within the national environment. The development of this and other aspects are a national matter.

emergency telephone notification systems: specific category for a system that uses the telephone, in conjunction with other elements, including computer hardware and software to notify persons of an emergency

NOTE: May include changeable message signs, sirens, telephone and other media.

originating network: access network from which the emergency call was originated

telecommunications for disaster relief: the provision of telecommunications with and within the region affected by the disaster, including international communications to and from the disaster area and local communications at the disaster area

NOTE: Where feasible TDR would be provided by the use of existing public telecommunications services and facilities. This might include for example invoking the preference scheme described in ITU-T Recommendation E.106 [7] for the International Telephone Service E.105 [8].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BSC	Base Station Controller
CAP	Common Alerting Protocol
CBCH	Cell Broadcast CHannel
CBS	Cell Broadcast Service
COMAH	Control Of Major Accident Hazards
DAB	Digital Audio Broadcasting
DVB-H	Digital Video Broadcast-Handhelds
ECC	Emergency Control Centre
ENS	Emergency Notification System
ETAS	Emergency Telephone Alert System
ETS	Emergency Telecommunication Service
EU	European Union
GIS	Geographic Information System
GSM	Global System for Mobile telecommunications
HLR	Home Location Register
HTML	Hyper-Text Markup Language
IMS	IP Multimedia Subsystem
IVR	Interactive Voice Response
MBMS	Multimedia Broadcast/Multicast Service
MBS	Multimedia Broadcast Service
MMI	Man-Machine Interface
MMS	Multimedia Messaging Service
NGO	Non-Governmental Organization
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
QOS	Quality of Service
RDS	Radio Data System for VHF/FM broadcasting
RNC	Radio Network Controller
SDCCH	Stand-alone Dedicated Control CHannel
SDO	Standards Development Organization
SMS	Short Message Service
TDR	Telecommunications for Disaster Relief
TETRA	TErrestrial Trunked RAdio
UMTS	Universal Mobile Telecommunication System
USSD	Unstructured Supplementary Service Data

VBI Voice Break-In
VLR Visitor Location Register

4 Nature of communications from authorities to citizens

In the basic and routine case of an emergency situation the number of affected individuals is limited; the victims, endangered persons, the person reporting the emergency, the operator at the ECC/PSAP and the personnel deployed to the incident. The fact that the Emergency Authority reaches the victims and provides assistance is the expression of the relationship between the authority and the citizen.

There are several situations where this simple model does not apply; in general they correspond to mass phenomena (flooding, hurricane) forecasted or not, to the combination of several risks (a fire of toxic products, a snow storm at peak traffic hours) or the evolution of an apparently limited incident (the rescued person is recognized as a bearer of a contagious disease).

It may also be necessary to mobilise private organizations, charities and NGOs to participate in the rescue actions. These services and organizations may be required on a priority basis at the incident location.

To maximize efficiency, authorities need to reach as many citizens as possible present in a given area (inhabitants, passers-by, travellers and tourists etc.) or entering the area or in close proximity to the area during the emergency. They shall be able to present the citizens with an appropriate message. It should be noted that this is not a one shot scenario. It may be necessary for the message to be repeated and/or updated on a number of occasions. In addition the transmitted message could be of a general nature or it maybe necessary to target the message to a specialized audience.

The priority of the authorities is to assess the extent of the incident, the resources required and availability of remaining facilities. In addition authorities will require timely and accurate information as to the capabilities and performance of telecommunications infrastructure in the affected area. It is assumed that during such situations the local, regional or national authorities would establish an emergency operations centre, in line with pre-planned and regularly tested procedures.

The information contained within the present document explains how systems would function and the performance that could be anticipated to support the communications requirements of the authorities towards the citizens.

When trying to make use of the present document in a specific case, the attention of the reader is drawn on the following:

- It would be vital to conduct a risk analysis of the various scenarios along with an associated plan dealing with the mitigation and control of the high likelihood and/or high impact risks.

- The fact that a system or a service is convenient for a situation does not mean that it would be easy or quick to make use of it, especially when a mass usage is needed or when a specific area is targeted.

- An inadequate emergency warning or notification system causes deterioration of public confidence in authorities and poor public relations. Most importantly, lack of prompt, complete information flow can cause loss of life and property.

Therefore any possible usage of communication services should be the subject of an agreement with the concerned operators, and a description of the related procedure for its entry into force should be prepared.

5 Objectives and guidelines for an emergency notification service

The vision is of a European Union where, when facing an emergency or disaster situation, citizens can get hold of adequate information, when needed, and even in the desired language in order to protect citizens more effectively. When travelling, working or studying in a Member State, citizens need to be able to understand information given i.e. signals, signs and other ways of warning and information. If in danger, whether it is an earthquake, a flood or an avalanche, citizens need to be able to understand what authorities and the people of the country want to tell them - in order to be able to take care of themselves and those dependent on them.

There are differences in the geography, risks, culture and legislation in the Member States -but there are also similarities. We can learn a lot from the existing, good examples in the EU, and, in co-operation, we can find ways of using existing and new methods and technology to move towards a safer Europe.

5.1 Service objectives

Emergency Notification Systems need the ability to provide communications in support of many different types of scenarios. Communication shall be possible within the following contexts:

- Citizens in their own dwelling.
- Citizens at their place of work.
- Citizens in public venues (e.g. sports complexes, shopping malls, etc.).
- Citizens travelling on foot.
- Citizens travelling using other transportation facilities.

An effective Emergency Notification system will be capable of disseminating information to a large number of individuals within specifically affected areas. Emergency Notification systems shall:

1) Provide high speed message delivery.
2) To deliver messages within a planned specified time.
3) Offer sufficient details of the emergency situation.
4) Provide sufficient instructions regarding actions to be taken by the public.
5) Allow strategic information delivery to specific targeted audiences or geographies.
6) Be fully accessible to the right people.
7) To deliver messages simultaneously to a large audience.
8) Be intrusive, but only service-interrupting in the case the same service is required for the notification.

5.2 Service features

There are numerous methods available for emergency notifications. A heterogeneous strategy is commonly required, offering a number of available channels through which the public can receive the emergency messages. This strategy helps to ensure quick and efficient notification.

Regardless of the technological solution, such systems shall have the features as described in the remainder of this clause.

5.2.1 Capacity

Emergency notification systems shall be capable of delivering alerts in a short predictable period of time, to a target audience of reachable citizens on the technology that is available to them at that time. The engineered capacity of a system is ultimately a user defined parameter. However, to be effective emergency notification systems shall be designed with a view to supporting large metropolitan areas.

It shall be possible to provide an alert:

- to 50 % of the citizens in the relevant area within 3 minutes; and
- to 97 % of the citizens in that area within 5 minutes.

The period of three minutes is the period between the moment when the message is submitted to the notification system and the moment the message is provided to the citizen.