



**Emergency Communications (EMTEL);
Basis of requirements for communication of individuals
with authorities/organizations in case of distress
(Emergency call handling)**

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Foreword

This Technical Report (TR) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

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

- **ETSI TR 102 180: "Emergency Communications (EMTEL); Basis of requirements for communication of individuals with authorities/organizations in case of distress (Emergency call handling)";**
 - ETSI TS 102 181 [i.20]: "Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies";
 - ETSI TS 102 182 [i.21]: "Emergency Communications (EMTEL); Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies";
 - ETSI TR 102 410 [i.22]: "Emergency Communications (EMTEL); Basis of requirements for communications between individuals and authorities whilst emergencies are in progress".
-

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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Introduction

The provision of Emergency Telecommunications is one of the most important duties of a public authority towards individuals present on its territory. Individuals, Authorities and Emergency response teams therefore have a need for dedicated, high quality communication systems operating at all times.

In the past this area of communications has been developed, provided and organized by the national telecommunications operators and the national safety and security agencies/organizations. In today's deregulated and liberalized telecommunications market, operators of public telephone networks have the obligation to provide this type of communication under their regulation on a European and national basis.

At European Union level, a common emergency call number (112) is applied. In certain countries it may co-exist with former numbering codes maintained by the national authorities and dedicated to more specific usages or needs. The proposals of the present document are primarily focussed towards the deployment of a consistent service based on the 112 number; it is a matter of national decision and initiative to apply them for the other numbers in use for emergency calling.

The present document should be read as a contribution to the harmonization of the use of E112 by the emergency and disaster response agencies. Based on inputs from all parties in the Emergency Service User Community involved in providing such services, and after due adoption, the requirements expressed should be distributed to the relevant ETSI Technical Bodies, who are requested to take this material into account when amending existing, or drafting new, deliverables for services and systems to support Emergency Communications. However, the present document can also be made available to other organizations and mainly at European Commission level as a contribution to their work, as the case may apply.

The present document catalogues the requirements on Emergency Call Handling as seen by the Emergency Service User Community. Clause 4 sets out the requirements on the emergency call service itself, including: service provision, end-user expectations and related requirements, terminal equipment, the call originating network, interconnection between networks, the functionality on the PSAP (Public Safety Answering Point), functionality on involved and transit networks, and network management requirements. Clause 5 outlines the benefits of a European-wide interface between operators and Public Safety Answering Points. Clause 6 lists the special requirements when making emergency calls by disabled, elderly and young users. Clause 7 refers to the need for special requirements for emergency calls in a foreign language. Where clause 8 quotes the data protection provisions in the case of an Emergency situation and clause 9 refers to the need for future considerations in further networks still to be defined. Clause 4 is the main clause describing the basic working of the service and its components, with a catalogue of the types of access to be considered and their special networking considerations.

NOTE: A specific mention may be made about the processing of the location information to be sent with the emergency call as the Directive 2009/136/EC [i.27] and the Directive 2009/140/EC [i.26] have significant changes from the Directive 2002/21/EC [i.3] and the Recommendation C(2003)2657 [i.2] of 25/07/2003.

Additionally, the emergence and development of alternative offers based on technologies such as VoIP (Voice over Internet Protocol) is creating critical situation linked to the definition of the service offered. There is a need to consolidate the comprehensive provision of the emergency call (including short numbering, adequate origin-dependent routing, no charge and transmission additional information) as a reference requirement in the planning of future systems.

Consideration is also given to the use of SMS, in conjunction with an emergency call, and the emerging applications which combine different technologies (e.g. Multimedia Message Services or GPS).

1 Scope

The present document gives an overview of the requirements for communication from individuals to authorities and organizations in all types of emergencies. It collects operational and organizational requirements as a basis for a common 112 service, including location information (E112). Although many of the requirements collected from network operators, service providers (e.g. emergency response organizations) and users 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 effectiveness by user increased awareness by using standardized solutions.

The essence of an emergency call is to establish a direct and real time means of conversation between the calling party and an officer, in a Public Safety Answering Point, in charge of bringing assistance or organizing response. However, the scope of the present document also encompasses various types of services that can bring an added value to this basic scenario or add new scenarios, such as transmission of data to extend the information made available to the PSAP's agent or to facilitate access of people suffering disabilities or impairments.

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

The present document outlines the basis for technical, operational, organizational or regulatory requirements.

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

Requirements for emergency calls of a private nature (e.g. vehicle/road assistance) and directed to an emergency service provider not being an emergency service provider recognized by a government are not covered by the present document.

It is anticipated that the present document will be maintained, by taking in line with developments at regulatory level and more specifically within the CoCom (Communication Committee for the Electronic Communications Directives) at the European Commission (EC) level.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 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.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TS 102 164: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Emergency Location Protocols [OMA-TS-MLP-V3-2-20051124-C]".
- [i.2] C(2003)2657: Commission Recommendation of 25th July 2003: "Recommendation on the processing of caller location information in electronic communications networks for the purpose of location-enhanced emergency call services", published on O.J.E.U. L 189/49 the 29.7.2003.
- [i.3] Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive).
- [i.4] Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).
- [i.5] ETSI EG 202 116: "Human Factors (HF); Guidelines for ICT products and services; "Design for All"".
- [i.6] ETSI ETR 333: "Human Factors (HF); Text Telephony; Basic user requirements and recommendations".
- [i.7] Recommendation ITU-T V.18: "Operational and interworking requirements for DCEs operating in the text telephone mode".
- [i.8] ETSI ETS 300 381: "Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids".
- [i.9] ETSI ETS 300 488: "Terminal Equipment (TE); Telephony for hearing impaired people; Characteristics of telephone sets that provide additional receiving amplification for the benefit of the hearing impaired".
- [i.10] ETSI TR 102 133: "Human Factors (HF); Access to ICT by young people: issues and guidelines".
- [i.11] Recommendation ITU-T E.115: "Computerized directory assistance".
- [i.12] ETSI TS 123 271: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Functional stage 2 description of Location Services (LCS) (3GPP TS 23.271)".
- [i.13] CEN/CENELEC Guide 6: "Guidelines for standards developers to address the needs of older persons and persons with disabilities".
- [i.14] ISO/IEC Guide 50: " Safety aspects - Guidelines for child safety".
- [i.15] Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).
- [i.16] Void.
- [i.17] Void.
- [i.18] CGALIES outputs (Co-ordination Group on Access to Location Information by Emergency Services) served as a base for the EC-Recommendation.
- [i.19] Void.
- [i.20] ETSI TS 102 181: "Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies".
- [i.21] ETSI TS 102 182: "Emergency Communications (EMTEL); Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies".

- [i.22] ETSI TR 102 410: "Emergency Communications (EMTEL); Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress".
- [i.23] ETSI TR 102 445: "Emergency Communications (EMTEL); Overview of Emergency Communications Network Resilience and Preparedness".
- [i.24] ETSI TS 123 040: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Technical realization of the Short Message Service (SMS) (3GPP TS 23.040)".
- [i.25] ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008)".
- [i.26] Directive 2009/140/EC on a common regulatory framework for electronic communications networks and services (Framework Directive).
- [i.27] Directive 2009/136/EC on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).
- [i.28] NICC® ND 1432 V1.1.1 (2015-03): "SIP-PBX Configurations to Support Emergency Service".

NOTE: Available at <http://www.nicstandards.org.uk/files/current/ND1432V1.1.1.pdf>.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

emergency call: call from an individual who wants to reach the PSAP

emergency call facilities: emergency telephone stanchions/boxes, fire alarms, etc.

NOTE: These facilities are either publicly accessible, or located within private premises.

emergency call with SMS: emergency call complemented by SMS

NOTE: The purpose of the SMS is to convey context information or to help a communication with impaired people.

Emergency Control Centre (ECC): facilities used by emergency organizations to handle rescue actions in answer to an emergency calls

NOTE: A PSAP forwards emergency calls to the Emergency Control Centres.

emergency number: special short code(s) or number(s) which is used to place an emergency call

NOTE: The emergency number is used by the individual in need of assistance from the emergency services. There exist two different types of emergency numbers in Europe:

- 1) **European emergency number, 112:** the emergency number for pan-European access to emergency services and used, for example, in the European Union member-states, Switzerland and other European countries.
- 2) **National emergency numbers:** each country may also have a specific set of emergency numbers.

emergency response organization: e.g. the police, fire service and emergency medical services

emergency service: service, recognized as such by the Member State, that provides immediate and rapid assistance in situations where there is a direct risk to life or limb, individual or public health or safety, to private or public property, or the environment but not necessarily limited to these situations

NOTE: See Commission Recommendation C(2003)2657 [i.2].

enhanced 112 (E112): emergency communications service using the single European emergency call number, 112, which is enhanced with location information of the calling user (see Commission Recommendation C(2003)2657) [i.2])

individual: any person (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/her situation, the individual can send alerts or provide information to the emergency services, but in many cases is either passive or a potential victim.

location information: data enabling to know the geographic position of a terminal used by the calling party

originating network: portion of the communications network(s) that provides the connection of a user's equipment to the public communication services from which the emergency call was originated

overdialling: dial and send additional digits, beyond the normal/minimum length of a valid number, for example to obtain a special service required

NOTE: The extended Dialling string is entered within a specified time and processed without any intermediate dial-tone or announcements.

Public Safety Answering Point (PSAP): physical location where emergency calls are received under the responsibility of a public authority

NOTE: See Commission Recommendation C(2003)2657 [i.2].

user access: point of access to a telecommunication network where an emergency call can be requested

NOTE: This includes public telephones and "emergency call facilities".

3.2 Abbreviations

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

CEN	Comité Européen de Normalisation
CENELEC	Comité Européen de Normalisation ELECtrotechnique
CGALIES	Co-ordination Group on Access to Location information by Emergency Services
CLI	Calling Line Identity
CoCom	Communication Committee for the Electronic Communications Directives
EC	European Commission
ECC	Emergency Control Centre
EMTEL	EMergency TELcommunications
ETS	ETSI Technical Specification
GAD	(Universal) Geographic Area Description
GPS	Global Positioning System
GSM	Global System for Mobile telecommunications
HF	Human Factor
ICT	Information and Communication Technologies
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identifier
IP	Internet Protocol
IPR	Intellectual Property Right
ISO	International Organization for Standardization
LCS	LoCation Services
MMI	Man-Machine Interface
MMS	Multimedia Message Services
PBX	Private Branch Exchange
PC	Personal Computer
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PSAP	Public Safety Answering Point
SIP	Session Initiation Protocol
SMS	Short Message Service
SMS-SC	Short Message Service Service Centre

TB	Technical Body
TCP	Transport Control Protocol
TE	Terminal Equipment
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networks
TR	Technical Report
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USIM	Universal Subscriber Identity Module
VoIP	Voice over Internet Protocol
VPLMN	Visited PLMN
VPN	Virtual Private Network
XML	eXtensible Mark up Language

4 Description of the emergency call service

4.1 General description

4.1.0 Regulatory requirements

Directive 2002/22/EC [i.4] requires that in addition to any other national emergency call number specified by the national authorities all end users of publicly available telephone services have the possibility to call the emergency services free of charge by using the single European emergency call number "112". A more complete listing of the European Commission (EC) regulatory principles can be found at ISO/IEC Guide 50 [i.14].

The objective of the requirement is to maximize the probability that a user will be able to make a basic telephone call to the appropriate emergency service whenever necessary without imposing undue constraints on terminals, networks or service providers, and to provide the emergency service with as much location information as reasonably possible. The scenarios in which this objective should be met will become increasingly complex due to factors such as:

- the introduction of new services including services that are backwards compatible with basic telephony;
- the development of both new special purpose terminals and the support of telephony on multi-purpose terminals;
- the provision of multiple different services and choices of service provider accessible (e.g. via carrier pre-selection) at a single network termination point.

To facilitate these regulatory principles, details of the requirements are provided in the following clauses.

Additionally, Article 26, 5) of Directive 2009/136/EC [i.27] provides that "*Member States shall ensure that undertakings concerned make caller location information available free of charge to the authority handling emergency calls as soon as the call reaches that authority. This shall apply to all calls to the single European emergency call number "112". Member States may extend this obligation to cover calls to national emergency numbers. Competent regulatory authorities shall lay down criteria for the accuracy and reliability of the caller location information provided.*"

This article supersedes the different Recommendations of Commission recommendation C(2003)2657 [i.2] of 25/07/2003.

In some cases, the service may be complemented by the transmission of information in the form of SMS. This information is not provided by the network and it is routed via a different path than the voice service. It should be noted that the SMS service has several limitations, such as the absence of guaranteed real time delivery. The use of SMS should therefore be considered for specific situations (e.g. users with special needs, or when voice is not possible).

Additionally to the previous features, the provision of data besides voice can increase the effectiveness of the whole rescue organization. For example, accurate location information of the caller, derived from GPS integrated in mobile phone terminals, can be provided along with the voice call. This information combined at the PSAP with other Geographic Information Services can be used to automatically display maps or the status of resources in the vicinity. Other examples of data that may complement the basic voice call include Multimedia message Services (MMS) and can also be used to provide e.g. pictures or video of the field situation and of the victims.