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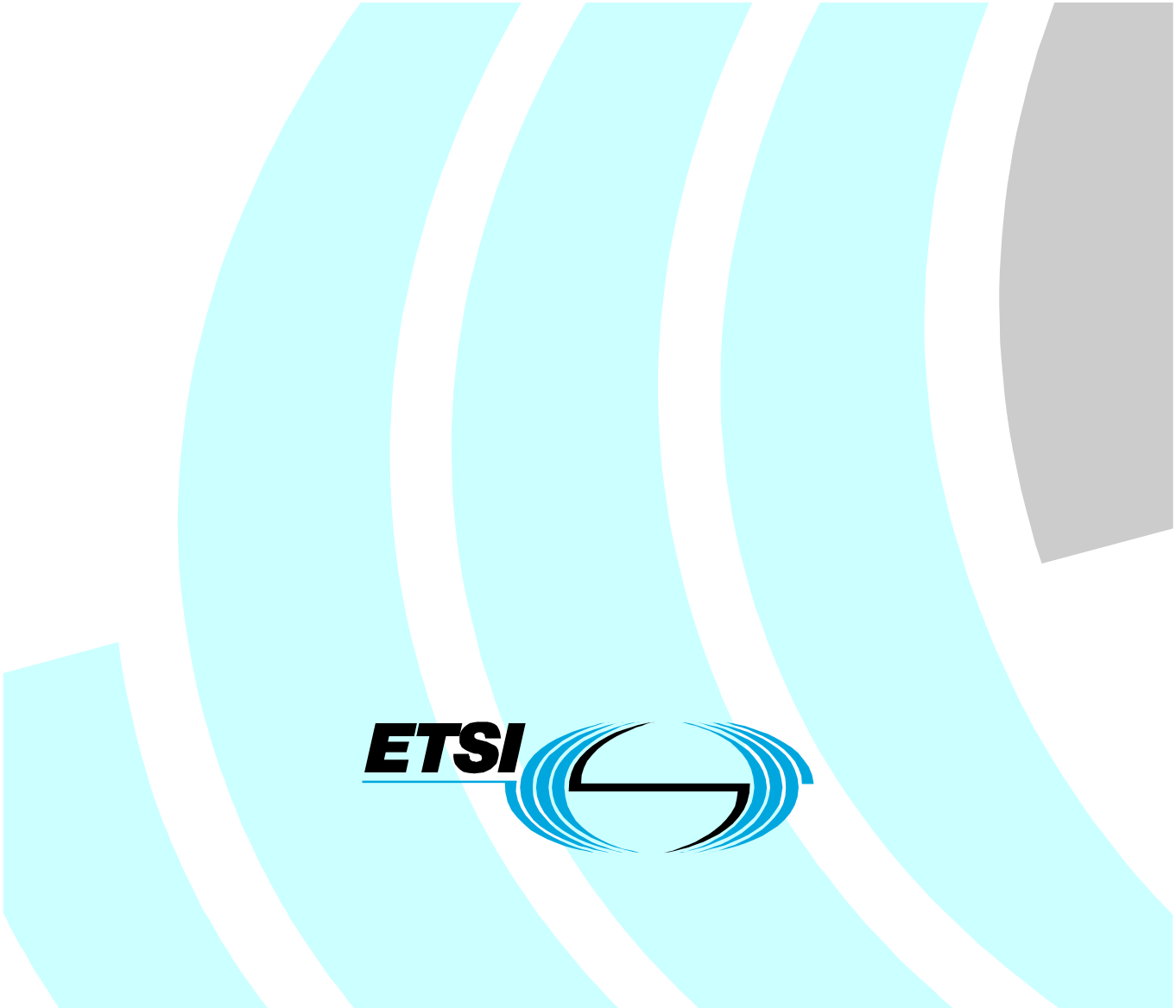
Special Report

Requirements for communication of citizens with authorities/organizations in case of distress (emergency call handling)



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Foreword

This Special Report (SR) has been produced by Advisory Committee Operational Co-ordination Group (OCG).

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

SR 002 180:	**"Requirements for communication of citizens with authorities/organizations in case of distress (emergency call handling)";**
SR 002 181	"Requirements for communication between authorities/organizations during emergencies";
SR 002 182:	"Requirements for communications from authorities/organizations to the citizens during emergencies".

Introduction

The provision of Emergency Telecommunications is one of the most important duties of a public authority towards its citizens. Citizens, 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 licences on a European and national basis.

Recently the European emergency call number (112) has been created. The Emergency Telecommunications service is being enhanced by the provision of caller location information and there is ongoing harmonization of the use of E112 by the police, fire-fighting, medical response and disaster response agencies. As a result ETSI has taken the initiative to collect and publish requirements from the Emergency Service and Civil Protection Communities and collect the Emergency Communications requirements in Special Reports. This has included all parties involved in providing such services. Following the adoption of these requirements from the Emergency Service User Community, the relevant ETSI Technical Bodies are requested to take this material into account when amending existing, or drafting new deliverables for services and systems to support Emergency Communications.

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.

The implementation issues related to access to location information by emergency services (E112) in the European Union have been analysed by CGALIES (the Co-ordination Group on Access to Location Information by Emergency Services). This work was established by the European Commission Services as a partnership between public service and private sectors to find harmonized, timely and financially sound solutions. The results of those studies are not binding proposals, they were offered to the European Commission, the European Union and its Member States, including the public and the private sector for broad consideration. They serve as a base of an EC-Recommendation.
See: http://www.telematica.de/cgalies/

Both the Directive 2002/21/EC [3], and the commission recommendation C(2003)2657 [2] of 25/07/2003 on the processing of caller location information in electronic communication networks for the purpose of location enhanced emergency call services, each set out recommendations and requirements which network operators, equipment manufacturers and emergency centres must address.

1 Scope

The present document gives an overview of the requirements for communication from citizens to authorities and organizations in all types of emergencies. It collects operational and organizational requirements as a basis for a common 112 service, including caller 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 present document also collects already established requirements for EMTEL and gives guidance on how to find the standardization work published or ongoing. The document identifies also the areas needing particular attention from the experts and refers to identified documents in preparation in SDO's.

The present document itself does not impose any technical, operational, organizational or regulatory requirement; it is a collection of requirements and recommendations.

The present document is 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.

2 References

For the purposes of this Special Report (SR) the following references apply:

[1] ETSI TS 102 164: "Services and Protocols for Advanced Networks (SPAN); Emergency Location Protocols".

[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.

[3] Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive).

[4] Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

[5] ETSI EG 202 116: "Human Factors (HF); Guidelines for ICT products and services; Design for All".

[6] ETSI ETR 333: "Human Factors (HF); Text Telephony; Basic user requirements and recommendations".

[7] ITU-T Recommendation V.18: "Operational and interworking requirements for DCEs operating in the text telephone mode".

[8] ETSI ETS 300 381: "Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids".

[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".

[10] ETSI TR 102 133: "Human Factors (HF); Access to ICT by young people: issues and guidelines".

[11] ITU-T Recommendation E.115: "Computerized directory assistance".

[12] ETSI TS 123 271: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Location Services (LCS); Functional description; Stage 2 (3GPP TS 23.271 version 5.7.0 Release 5)".

[13] CEN/CENELEC Guide 6: "Guidelines for standards developers to address the needs of older persons and persons with disabilities".

[14] ISO/IEC Guide 50: " Safety aspects - Guidelines for child safety".

[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).

[16] ETSI TS 101 109 (V7.2.0): "Digital cellular telecommunications system (Phase 2+); Universal Geographical Area Description (GAD) (3GPP TS 03.32 version 7.2.0 Release 1998)".

[17] ETSI SR 002 299: "Emergency communications; Collection European Regulatory Principles".

3 Definitions and abbreviations

3.1 Definitions

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

access network: is the portion of the Telecommunications Network that provides access to the switching function, and terminates the User Access signalling, in a PLMN this is a radio access via a Base Station

NOTE: c.f. […Q.931, EN 300 403, ETSI TS 124.008].

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))

emergency call: call from a user to an emergency control centre

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

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

emergency caller: user who calls an emergency service via an emergency call

emergency control centre: facilities used by emergency organizations to accept and handle 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 contact the PSAP to provide emergency services

NOTE: The emergency number, is used by the emergency caller to request assistance from the Emergency services. There exist two different types of Emergency numbers in Europe:

1) **European emergency number, 112:** unique emergency number for pan-European and GSM Emergency services and used, for example, in EU 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 (see Commission Recommendation C(2003)2657))

location information: data processed in a public mobile network indicating the geographic position of a user's mobile terminal, and data in a public fixed network indicating the physical address of the termination point (see Commission Recommendation C(2003)2657))

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

Public Safety Answering Point (PSAP): physical location where emergency calls are received under the responsibility of a public authority (see Commission Recommendation C(2003)2657))

user access: point of access to a telecommunication network where an emergency call can be requested. This includes public telephones and "emergency call facilities"

3.2 Abbreviations

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

CLI	Calling Line Identification
EAP	Emergency Access Point
EC	European Commission
GSM	Global System for Mobile telecommunications
ICT	Information and Communication Technologies
IMEI	International Mobile Equipment Identifier
LCS	Location Services
MSC	Mobile Switching Centre
PLMN	Public Land Mobile Network
PSAP	Public Safety Answering Point
SIM	Subscriber Identification Module
SMS	Short Message Service
TB	Technical Body
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network

4 Description of the emergency call service

4.1 General description/provisions

Directive 2002/22/EC [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 [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 information about the location of the caller 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.

4.1.1 User related requirements

Users should be able to make a basic telephone call to an emergency service on any terminal (see annex C for HF requirements) that supports outgoing calls to publicly available telephone services unless the terminal is clearly marked, or its software operation clearly identifies it, as incapable of making such calls under normal or power failure conditions. It is important that users" reasonable expectations are met and that users are generally made aware of any limitations in access to emergency services so that:

- persons responsible for premises may make adequate alternative provisions;
- users do not waste time in an emergency trying but failing to make a call.

4.1.1.1 Public Network Access Points

All telephony terminal equipment should have the ability to fulfil the user's need for an emergency call once it is positioned to access a public telecom network (of a compatible design).

Additionally, the network access point should enable the emergency call, even when :

- normal Originating Telecommunications Services have been barred (e.g. because of non-payment of bills);
- the equipment (e.g. SIM card in a mobile phone) is protected by an identification/authentication procedure, unknown to the user in advance;
- the emergency caller using a mobile phone is outside the coverage area of his home network, provided that the area is covered by another mobile network operator and that the mobile phone is technically compatible with the alternate network;
- the emergency caller using a cordless phone is outside the coverage area of his home base station, provided that the area is covered by another base station belonging to the same or to a different network operator and that the cordless phone is technically compatible with the alternate base station.

All cases of national roaming scenarios are covered by national regulatory requirements and legislation.

4.1.1.2 Public pay telephones

Directive 2002/22/EC [4] requires that it be possible to make emergency calls from public pay telephones using the single European emergency call number "112" and other national emergency numbers, all free of charge and without having to use any means of payment.

4.1.1.3 Public telephones

From public telephones, it should be possible to make emergency calls at any time without the assistance of an operator.

4.1.1.4 Dedicated Emergency call posts with voice application

Only emergency call facilities with voice application connected directly to a public network or a PSAP are covered by the present document. Directive 2002/22/EC [4] requires that it should be possible to make an emergency call from an emergency call post or facility free of charge and without knowing the emergency call numbers. Emergency call posts or facilities should be easy to use and not require specific language knowledge.

4.1.1.5 Private coin and card payphones

Private coin, token, and card payphones in restaurants, bars, etc. should allow emergency calls to be made free of charge and without having to use any means of payment.

4.1.1.6 Private Networks

Emergency calls from private networks can be routed to the public network.

When external assistance is required an emergency call should be forwarded to the PSAP or the corresponding emergency control centre.

This includes phones in public places where users require to be able to make emergency calls, free of charge and without having to use any means of payment.

Location information within a private network should be made available when possible and comply with the requirements of the corresponding emergency authorities in the area.

4.1.1.7 Multipurpose facilities

For multipurpose call facilities (e.g. customer assistance for vehicles and accidents) functionality should separate the operation modes in order to avoid unjustified calls to public emergency services.

4.1.2 Requirements applicable to the emergency call functionality of terminal equipment

Voice communication terminal equipment should be designed in such a way that emergency calls should be possible even if the terminal has a PIN-coded lock of the keypad; The requirement of this keypad over-ride is in accordance with national regulation. No terminal equipment feature should prevent an emergency call from being made. It is recommended to consider the operation of terminals connected to the fixed network in the case of mains power failures.

Provision of a user record allowing for precise location identification by cordless terminals connected to a visited base station of a fixed-line network similar to those available in a mobile terminal SIM card should be considered (see clause 4.2.1.2.1).

4.1.3 Speech quality of emergency calls

Where the network is not operating under abnormal conditions as a result of a disaster, the speech quality of emergency calls should not be worse than the user of a basic telephone service would experience on the majority of their calls. Where the service provider normally provides enhanced speech quality above that of a basic telephone service, e.g. wideband speech, there is no obligation to provide the enhanced quality on emergency calls.

Where the network is operating under abnormal conditions, as a general principle, if a trade-off exists between speech quality and connectivity, connectivity should be given priority, and intelligibility should be given priority over other aspects of speech quality.

4.1.4 Charge exemption for emergency calls

Emergency call services should be free of charge and possible without the calling party using any means of payment.

4.1.5 Ensuring emergency call conveyance

Network operators should make every reasonable effort to ensure the answering, inter-network forwarding and termination of emergency calls, including in exceptional circumstances such as insolvency, crises, catastrophes, etc.

4.1.6 Assignment of emergency calls to the appropriate emergency control centre

Nominated Emergency Control Centres of the emergency organizations deal with emergency calls from defined geographic areas. Emergency calls should be routed to, and handled within, the appropriate emergency control centre.

There should be an unambiguous mapping between the location of the caller and the emergency control centre responsible for the appropriate area.

More informational material can be found in CGALIES: http://www.telematica.de/cgalies/

4.1.7 Preventing effects of discrepancies in coverage

4.1.7.1 Radio Coverage Limit cases between mobile networks

Due to physical uncertainty and variations of radio coverage limits there are border effects where an emergency call can not be routed to the geographically assigned centre. Attention should be given to all parties involved, and more specifically operators, when designing the network to limit the occurrence of such cases. Where this case occurs, cooperation of emergency control centres should be applied and organized as appropriate.

4.1.7.2 International cooperation

A situation similar to that described in clause 4.1.7.1 may appear near country borders: Cross-border emergency call handling requires international cooperation between the European emergency organizations of neighbouring countries.

4.1.7.3 Cordless technologies

Situation similar to those described in clauses 4.1.7.1 and 4.1.7.2 may be applicable as well to cordless technologies that use fixed-line networks.

4.2 Recognition and treatment of emergency calls by the originating network

Each originating network should be able to recognize emergency calls by means of the emergency call number 112 in addition to the local national emergency numbers valid in the originating network.

4.2.1 Emergency call-related information

The originating network should generate the following emergency call-related information and transmit this information to the emergency control centre. The information may either arrive at the emergency control centre at the same time as the emergency call or be available for retrieval on demand from the emergency control centre during the call. The generation and transmission of the information should not delay the answering of the emergency call. Transit networks over which an emergency call is routed to an emergency control centre should forward this information in a transparent mode.

The commission recommendation 2003/58/EC of 25 July [15] on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services" (notified under document number C(2003)2657 [2]) and published on O.J.E.U. L 189/49 the 29.7.2003 recommends that the originating network should generate the following emergency call-related information and transmit this information together with the single European emergency call number "112" and other national emergency numbers, all free of charge and without having to use any means of payment.

Recommendations 4 and 9, are quoted below:

4. For every emergency call made to the European emergency call number 112, public telephone network operators should, initiated by the network, forward (push) to public safety answering points the best information available as to the location of the caller, to the extent technically feasible. For the intermediate period up to the conclusion of the review as referred to in point 13 below, it is acceptable that operators make available location information on request only (pull).

9. For each emergency call for which the subscriber or user number has been identified, public telephone network operators should provide the capability to public safety answering points and emergency services of renewing the location information through a call back functionality (pulling) for the purpose of handling the emergency.

More informational material can be found in CGALIES http://www.telematica.de/cgalies/

4.2.1.1 Calling line number of the access at which the emergency call is made

The originating network should transmit the calling line number of the access (CLI) at which the emergency call is made to the PSAP together with the emergency call. The Emergency Control Centre should be able to return a call to the number in the CLI.

If the access at which an emergency call is made has the feature to transmit a number specified by the user in addition to the user access number (Two Number Delivery Option, e.g. in the case of PABXs). The originating network should transmit both call numbers to the PSAP and these numbers should not be changed by any transiting network.

In cases where emergency calls are made from mobile phones operated without a SIM card the CLI cannot be determined and transmitted to the PSAP by the originating network. In countries where this is authorized, in this scenario, the originating network should provide alternative information to the PSAP. (see clause 4.2.1.3).

4.2.1.2 Indication of the emergency caller's location

Each emergency call should be accompanied with information that enables the emergency control centre to determine the caller's location at the time of calling. This information may be a geographical address or a set of geographical co-ordinates. The information should be accessible by the emergency control centre via a standardized interface after the initial contact is made. Location information should be accessible for as long as the emergency lasts.

NOTE 1: This information is required and has importance in the case of co-ordinating disaster relief. The impact this requirement has on the Network operator may vary on a national basis. The PSAP/Emergency Control Centre may only make requests for Location information in conjunction with an emergency call.

Typically, location information is based on the CLI received with the call for wireline networks, and on the geographical co-ordinates of the caller for wireless networks. For roaming cordless terminals due to emergency provision of the home base station CLI may be desirable.

NOTE 2: due to the support for Number portability or the inter-working with VoIP services determinating location information solely from the CLI may be impossible with some database arrangements, where the interrogation of the data is dependant on the network operator's database requested.

Recommendations 4 and 9 of the commission recommendation C(2003)2657 [2] are quoted below:

4. "For every emergency call made to the European emergency call number 112, public telephone network operators should, initiated by the network, forward (push) to public safety answering points the best information available as to the location of the caller, to the extent technically feasible".

9. "For each emergency call for which the subscriber or user number has been identified, public telephone network operators should provide the capability to public safety answering points and emergency services of renewing the location information through a call back functionality (pulling)for the purpose of handling the emergency."

4.2.1.2.1 Emergency caller using a fixed line access

For determining the location of an emergency caller using a fixed line access the site code of the access (e.g. geographical address of the access) can be used which is stored in the network operator's customer database. Specifications should exist for both:

- a push scheme, the address is automatically pushed with the initial call to the emergency centre together with the CLI;

- a pull scheme, the emergency call centre should be able to access during the call a database using the CLI and preferably the protocol defined in TS 102 164 [1] or the ITU-T Recommendation E.115 [11] query.

Cordless terminals roaming for emergency call form their Home base station to a Visited base station when the home base station is not operational due to the emergency event should provide their home base station's CLI. Provision of two clearly distinguished sets of CLI+address should be considered. For the PUSH scheme provision of information by the terminal originating the call may be considered.

NOTE: A pull scheme in the case of multiple carriers may require an Emergency centre to determine which location database to query; alternatively one option is to replicate data between databases.

4.2.1.2.2 Emergency caller using a mobile phone

For determining the location of an emergency caller using a mobile phone the location information should be specified for both:

- a push scheme, where the location information is automatically pushed with the initial call to the emergency centre together with the information contained in the CLI field;
- a pull scheme, the emergency call centre should be able to access the relevant data during the call a database using the CLI and preferably the protocol defined in TS 102 164 [1] or the TS 123 271 [12] query.

In cases where emergency calls are made from mobile phones operated without a SIM card, in countries where this is authorized, the originating network should provide location information to the PSAP/Emergency Control Centre in a Push scheme.

4.2.1.2.3 Indication of location in private networks.

Emergency calls from private networks can be routed to the public network.

When external assistance is required an emergency call should be forwarded to the PSAP or the corresponding emergency control centre.

Location information within a private network should be made available when possible and comply with the requirements of the corresponding emergency authorities in the area.

4.2.1.3 Identification of the mobile terminal equipment

When emergency calls are made from mobile phones operated without a SIM card, in countries where this is authorized, a CLI cannot be determined by the originating network. In this situation as an alternative, the equipment identity number (e.g. IMEI) may be transmitted by the originating network, subject to national legislative requirements.

This is conducive to misuse of the PSAP.

4.2.2 Network identification

All networks should transmit their network identification to the emergency control centre in a standardized way.

Recommendation 7 of the commission recommendation 2003/58/EC of 25 July [15] (notified under document number C(2003)2657 [2]) and published on O.J.E.U. L 189/49 the 29.7.2003 is quoted below:

7. "All location information provided should be accompanied by an identification of the network on which the call originates".

4.2.3 Minimum power supply for user accesses

If feasible, fixed network operators should provide a minimum power supply at their network termination points. This minimum power supply should enable telephone terminal equipment connected to the network termination point to be operational in the case of a local power failure for the placing of an emergency call.

4.2.4 Over dialling

Within Europe there are opposing national regulations, different numbering plans and switching equipment. It is therefore not possible to provide a general requirement.

4.2.5 Suppression of carrier selection/carrier preselection codes

Carrier selection and carrier preselection codes transmitted in conjunction with emergency call numbers should not be taken into account. The emergency call has to be routed to the responsible emergency call centre for the caller's location in all cases.

4.2.6 Emergency calls from other countries

112 and other emergency calls received from fixed networks of other countries should be terminated in the country of origin unless the calling terminal has indicated that it is a case of roaming cordless handset which base home station (non operational due to the emergency event) is connected to a foreign country wireline network.

4.3 Handling of emergency calls between networks (Optional)

If the originating network is not connected directly to the PSAP, a transit network is used between the two. To route the call towards the termination network a specific routing number(s) is used. This number identifies the responsible emergency service for a specific area.

In case of the transfer of the emergency call from the originating network towards another network (transit, termination) this number has to be inserted by the originating network as a destination number.

The transit network should forward/transfer the emergency call received from the originating network together with the call-related additional information (except location information see clause 4.2.1, retrieval/pull mode) immediately and without modification to the PSAP.

4.4 Providing termination of emergency calls to the PSAP

Any network to which a PSAP is directly connected should deliver the emergency call to the PSAP together with any related data, without undue delay or modification.

If the appropriate PSAP is not reachable, the call must be forwarded to the alternative PSAP.

PSAPs/Terminating networks should meet the functional requirements as detailed in clauses 4.4.1 to 4.4.3.

4.4.1 Features of the emergency control centres

PSAPs and Emergency control centres should be provided with access to all of the CLI related information.

More informational material can be found in CGALIES http://www.telematica.de/cgalies/.

4.4.2 Release of the emergency call

It should be possible for only the PSAP/Emergency control centre to release an emergency call relationship in the network.

4.4.3 Temporary blocking of Emergency Calls from a particular source

The PSAP should have the possibility to deliberately release/block repeated nuisance call attempts to the emergency telephone service from a particular source, see clause 4.1.1.1. This request may be relayed to the network where the nuisance call attempts to the emergency telephone service originate.

NOTE: This feature may not be supported in all countries.

4.5 Emergency call-specific functions for all involved networks

4.5.1 Priority of emergency calls

All network operators should accord emergency calls priority over all other calls. This priority should be accorded across public telecommunications networks.

In case of fixed-line networks priority should be accorded from the network access point from which the emergency call is made to the network termination point/PSAP to which the appropriate Emergency Control Centre is connected.

In case of emergency call facilities and publicly available telephones, priority should be accorded from the terminal equipment from which the emergency call is made to the network termination point/PSAP to which the appropriate Emergency Control Centre is connected.

In case of mobile networks priority should be accorded from the MSC to the network termination point/PSAP to which the appropriate Emergency Control Centre is connected. This includes the air interface.

Private networks should also give priority to emergency calls.

4.6 Network management support functions for delivery of Emergency calls to PSAPs

4.6.1 Monitoring of the lines and availability of the PSAPs

Transmission lines over which emergency telephone services are connected should be available without restriction. The terminating network and the PSAP permanently monitors the functionality and transmission quality of the transmission lines. Technical modifications and maintenance should not impair emergency telephone lines to the PSAP. If the quality falls below a minimum standard the network and PSAP should deactivate the access and check the availability and quality of the connection. Any such deactivation should not affect any call in progress.

4.6.2 Diversion of emergency calls

If a network access to a PSAP or a PSAP is deactivated or out of order the network must be able to divert incoming emergency calls to back-up/alternate equipment, lines, network access or PSAPs. The network management organization must inform the PSAP operations staff of these back-up facilities and any modifications made.

4.6.3 Permanent availability

Network operators should maintain reserved capacity to ensure termination of emergency calls to PSAPs and emergency control centres, including in situations where the standard capacity is fully utilized, subject to the nationally agreed Service Level Agreements.

4.6.4 Security provisions at access to PSAPs

The network operator should make reasonable provisions to mitigate against the impact of attack, either deliberate or accidental, to the access and core networks to which PSAPs are connected.

5 European-wide interface between operators and public safety answering points

Europe would benefit from a common interface between public operators and the entry point of the public safety organization (PSAP). This would drive down on implementation cost and speed implementation. But perhaps more importantly, this would ensure a common data format is used across Europe for E112 including requirements related to future advanced applications

The main requirements for such interface are as follows:

- Automatic terminal/network initiated real time location push to PSAP when 112 emergency call is made.
- Possibility for location pull/information pull by PSAP/emergency service (e.g. of street address from operators' active database).
- Adequate level of privacy protection (override of user setting by authorized emergency authorities only and for as long as the emergency lasts).
- Flexibility for upgrade/able to include future (not fully specified) requirements (e.g. from roadside telematic applications as they may emerge).

- Build-in assurance that commonality at "information passing level" is perpetual.
- No reliance on the home network when roaming internationally and in cases where national roaming is possible.
- Based on future proof technology (e.g. Internet TCP/IP/XML for connecting to standard PC based product at PSAP level).

More informational material can be found in CGALIES http://www.telematica.de/cgalies/.

6 Special requirements when making emergency calls by disabled, elderly and young users

6.1 General

It is important that all users are able to make calls to the European emergency services with equal ease of access.

For this to be achieved it is likely that people with disabilities, older people and children will need special requirements for emergency call handling. Some special considerations applicable to these users are discussed in annex B. In order to make an emergency call service available to the widest population possible the practice of Design for All as described in the EG 202 116 [5] should be applied to the design of any emergency call system or terminal. Any standards for equipment or facilities used for an emergency call service should take into account the requirements set out in CEN/CENELEC Guide 6 [13] and those of ISO/IEC Guide 50 [14].

6.2 Emergency control centres

All emergency control centres should be equipped to deal with incoming calls from users with special communications difficulties. Operators should be specially trained to handle calls from users with poor speech or with intellectual or mental impairments.

All emergency control centres should be able to handle calls incoming from any text terminal which should be treated in all other respects as normal emergency calls. As a minimum, equipment compliant with ETR 333 [6] and with ITU-T Recommendation V.18 [7] should automatically be available for such an incoming call. Call progress information should be available in ITU-T Recommendation V.18 [7] compliant form on all calls. All emergency control centres should be able to handle calls incoming from any text terminal which should be treated in all other respects as a normal emergency call.

Any SMS text message addressed to the single emergency call number or any national equivalent should be given priority over other text messages. Where appropriate, videophone facilities should be made available at emergency call centres.

6.3 Public telephones

Special attention should be paid to make all public telephones wheelchair accessible and arrangements should be made to make their position identifiable to blind users. All public telephones should be provided with inductive coupling in accordance with ETS 300 381 [8] and should provide additional receiving amplification compliant with ETS 300 488 [9]. A reasonable proportion of public telephones should be provided with text phone facilities.

6.4 Additional Information

More information related to the specific requirements related to disabled, elderly and young users can be found in annex B.

7 Special requirements for emergency calls in a foreign language

Emergency organizations should take appropriate steps to ensure that emergency calls can be translated from a foreign language (e.g. by means of a conference call).

8 Data protection

Emergency Control Centres must adhere to the relevant data protection provisions.

In the case of an emergency, the emergency centre may override the settings of the user as regards the processing of his or her location. The technical means should be provided for such override.

Furthermore, in addition to organizational measures, the necessary technical safeguards will be introduced to secure that a location pull can only be carried out in relation to an emergency (e.g. CLI-based), and only for as long as the emergency lasts.

Special actions during Emergency situations are allowed by Directive 2002/58/EC [15] 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).

9 Future and other networks

The present document is of necessity written around existing technologies. It is intended that all current and future public electronic communications networks capable of carrying emergency traffic take into account the principles described in the present document.

Annex A (informative): Basic Architecture

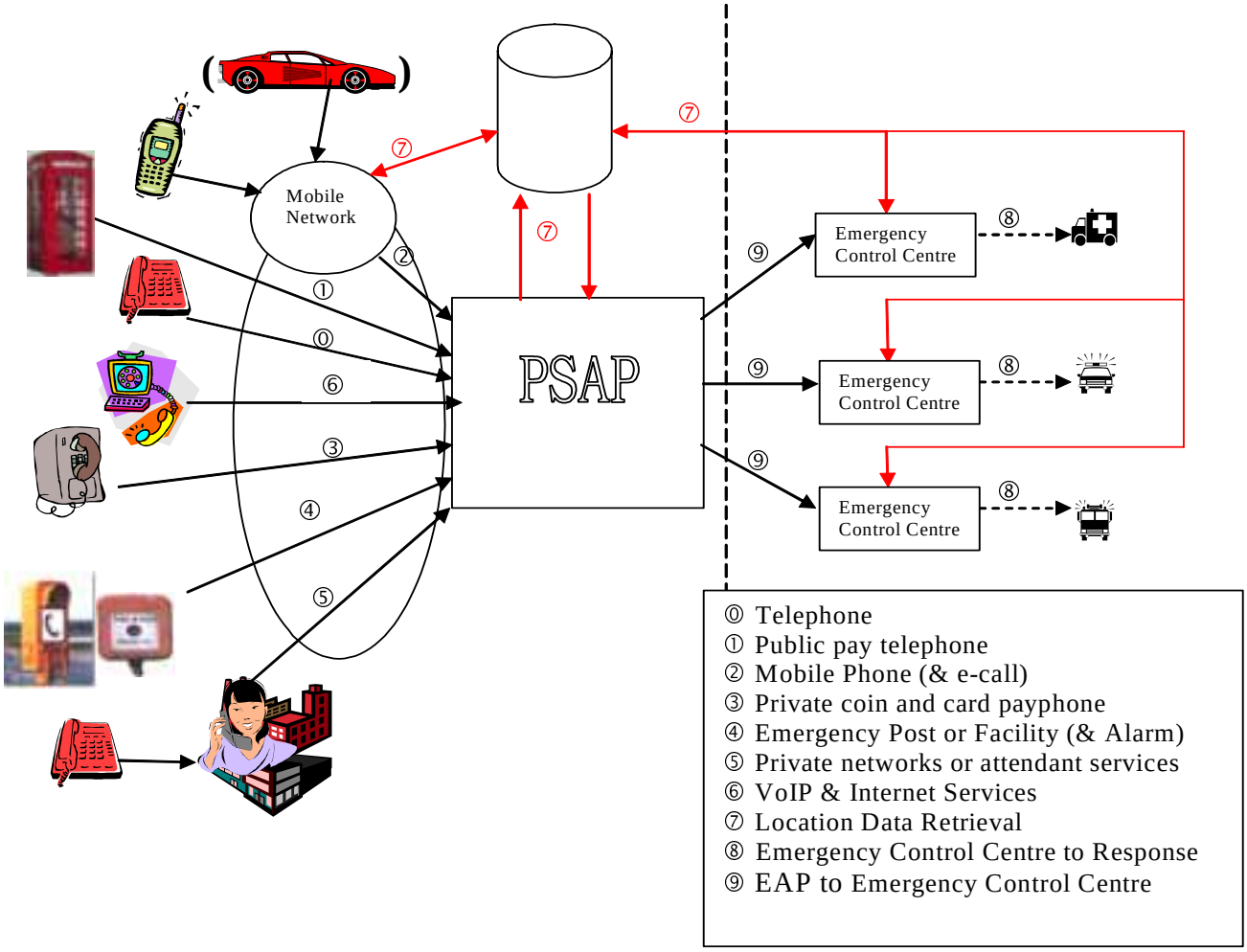

Figure A.1: Functional architecture

Figures A.2 and A.3 illustrate that the Functional Architecture can be mapped into two very different physical scenarios. The First showing a case where the PSAP and the Emergency Control Centre functionality is considered integrated into the same physical entity. The Second where the PSAP functionality is widely distributed and separate from the Emergency Control Centre functionality, and sits at the edge of the public network. In this case the network between the PSAP and the Emergency Control Centre is shown as a dedicated priority network, though physically there are today many ways that this could be achieved; e.g. by Leased Lines or Secure Virtual Private Networks (VPNs).

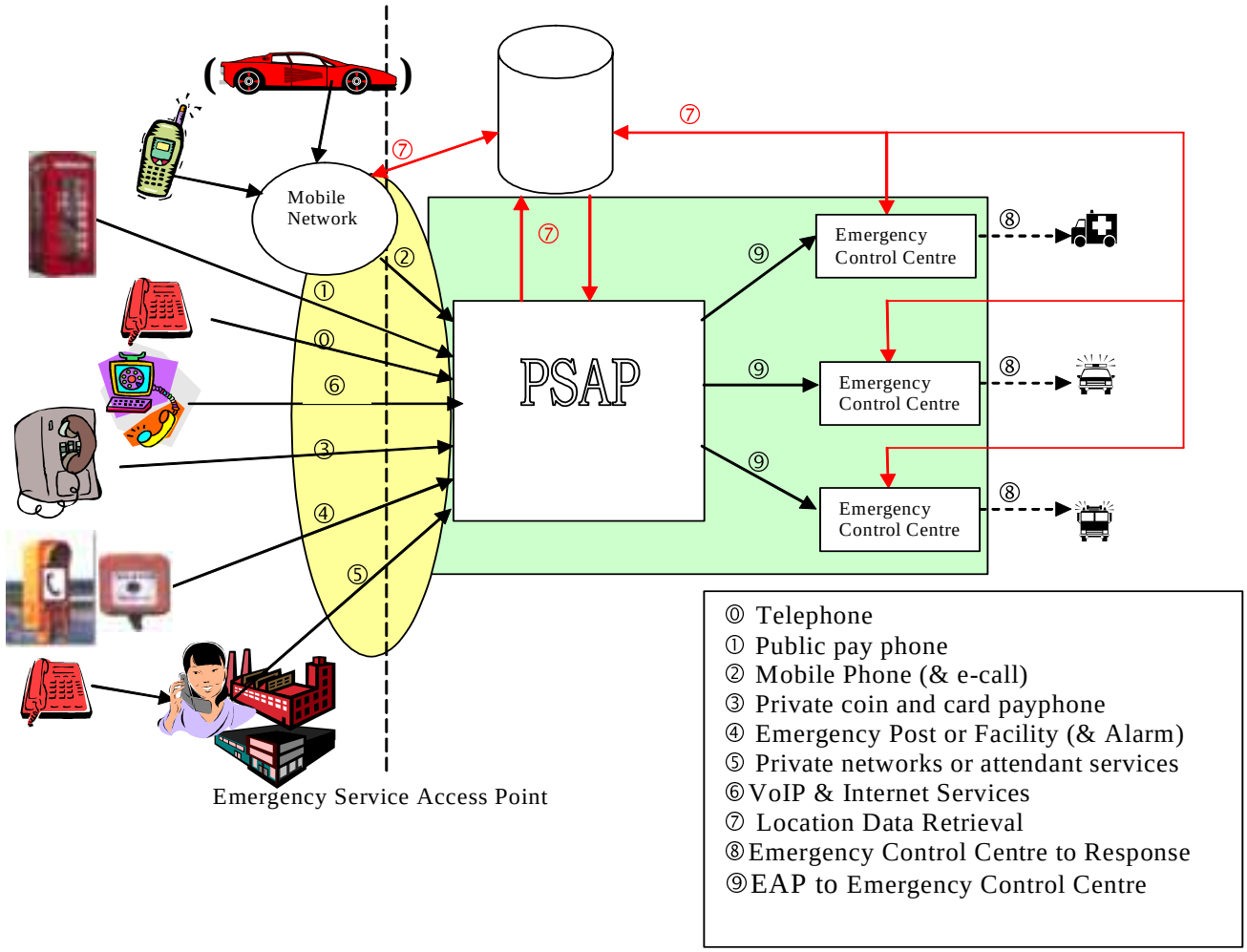

Figure A.2: Integrated PSAP and emergency control centre

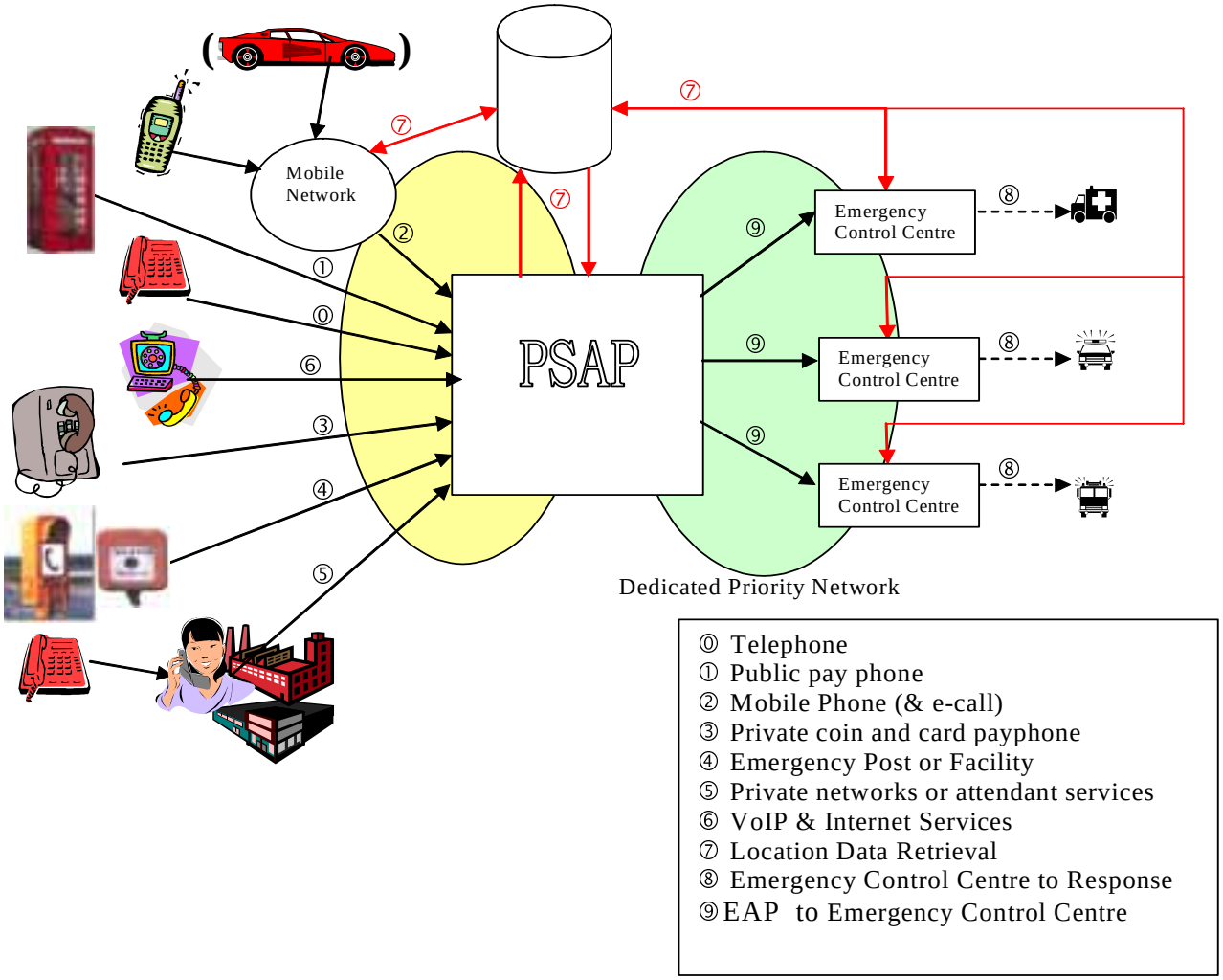

Figure A.3: PSAP on edge of the public network

Annex B (informative): Disabled, elderly and young users

B.1 General

As noted in clause 6.1, there are some user groups who are likely to need special requirements for emergency call handling. These are very diverse and have very different requirements. They may be divided into three main categories, though these will often overlap:

- People with disabilities.
- Senior citizens.
- Young people (children).

Each of these categories may again be divided into sub-groups, all of which have very different requirements.

B.2 People with disabilities

Disabilities fall into three basic categories, which can be further sub-divided

- ***Sensory*** impairments (sight, hearing, touch, taste/smell, balance).
- ***Physical*** impairments (speech, dexterity, manipulation, mobility, strength/endurance).
- ***Cognitive*** impairments (intellect, memory, language/literacy).

Characteristics of these disabilities and their relationship with ICT products and services are described in the EG 202 116 [5].

B.3 Elderly users

Elderly users (senior citizens) can be divided into age groups with very different requirements (these age groups are very general as there are people aged 80 who function as well as most 60 year olds, and vice versa):

- ***"Younger"*** senior citizens (55 years to 65 years).
- ***"Middle-age"*** senior citizens (6 years to 80 years).
- ***"Older"*** senior citizens (80+ years).

"Normal" changes related to ageing are not usually regarded as disabilities, even though the impairments incurred by ageing may be indistinguishable from those of younger disabled people. The effects of ageing are described in CEN/CENELEC Guide 6 [13].

In the grouping shown, it may be assumed that the "younger" group is exhibiting the onset of ageing effects, probably without significant impairments. In the "middle age" the impairments progress and develop and become more significant. The "older" group can be assumed to be so impaired as to need regular assistance and protection.

B.4 Young users

Young people (children): This group may be even more diverse than other groups (the capabilities of a three-year old are clearly very different from an eight-year old or a twelve-year old, but also in this group there are very large individual variations). The 0 year to 2 year olds will not be considered here:

- ***Pre-school*** children (3 years to 5 years).
- ***School age*** children (6 years to 12 years).
- ***Teen-agers*** (13 years to 18 years).

Issues and guidelines related to young users of Information and Communication Technologies (ICT) equipment can be found in TR 102 133 [10]. A very young pre-school child or baby may not be aware that they are in an emergency situation, but it can reasonably be assumed that they normally have available assistance from a protective third party.

B.5 Terminal Issues

It is likely that it will not be possible to create technical solutions that will allow any person in the above categories to successfully make an emergency call from any terminal without assistance from a third party. The creation of such all-embracing solutions are, in some instances, likely to be logically impossible and not just technically challenging. For example, if a public telephone was designed to allow the shortest three-year old child to physically initiate an emergency call, a tall blind user would find such a low mounted terminal impossible to use to make an emergency call.

In practice, many of the people who would have the most difficulty with independently making emergency calls would have the constant support of another person who would be able to make an emergency call on their behalf. People with very severe cognitive impairments or very young children are likely to have a full-time care worker or a parent that could make emergency calls for them. Such realities will make it reasonable to assume that some combinations of user and terminal can be seen as outside the scope of the general requirements of clause 4.1. However, blanket exclusion of classes of user should never be accepted.

Whenever users have people to "permanently" assist them, they could at some time lose their assistant and need to make an emergency calls whilst alone. If a three-year child is alone with a parent and the parent dies the child should be able to make an emergency call. However, if the child's parent died whilst out of the house in a public place with a public payphone there is likelihood that there would be some other adult that could make an emergency call on the child's behalf. Therefore it might be considered reasonable that a three-year old child should be able to make an emergency call from their home telephone but unreasonable that all public terminals should be designed so that the same child could make an emergency call from such a terminal.

B.6 Network Issues

Many deaf people and people with a hearing or speech impairment operate independently in the workplace, at home and socially. If a person is deaf or has a hearing or speech impairment, then he/she may rely on the transmission and/or reception of text or video to access the telephone service. Being able to read and/or type using a textphone enables most individuals who cannot hear or speak to use the telephone independently. The transmission and reception of text, voice and/or video via the telephone network needs to be considered. If the voice channel is used for the transmission and reception of text, voice and/or video, then the requirements for the "push" or "pull" of location information (i.e. CLI for wireline networks and on the geographical co-ordinates for wireless networks) would be covered by the requirements outlined in the present document for voice calls via the voice channel. If the data or video channels are used for the transmission and reception of text, voice and/or video, then location information also needs to be carried in association with the data channel and video channel to the PSAP and the Emergency Response Organization.

Annex C (informative): Allocation to Technical Bodies (TBs)

All ETSI TBs should carefully consider the content of the present document. The following table shows the primary recommendations for action within the TBs from OCG EMTEL.

Clause	Title	TB(s), other B(s) and rapporteurs
1	Scope	All
2	References	All
3	Definitions and abbreviations	All
3.1	Definitions	All
3.2	Abbreviations	All
4	Description of the emergency call service	TISPAN/3G (all)
4.1	General description/provisions	TISPAN
4.1.1	User expectations on Voice Networks for Emergency Calls	AT/MSG
4.1.1.1	Public Network Access points	TISPAN/AT
4.1.1.2	Public Pay telephones	AT
4.1.1.3	Public Telephones	AT
4.1.1.4	Dedicated Emergency call posts with voice application	TISPAN/AT
4.1.1.5	Private coin and card payphones	AT/SCP/MSG
4.1.1.6	Private Networks	AT/ECMA 32
4.1.1.7	Multipurpose facilities	MSG/3GPP
4.1.2	Requirements applicable to the emergency call functionality of terminal equipment	AT
4.1.3	Speech quality of emergency calls	TISPAN/STQ
4.1.4	Charge exemption for emergency calls	TISPAN/3GPP
4.1.5	Ensuring emergency call conveyance	TISPAN/3GPP
4.1.6	Assignment of emergency calls to the appropriate emergency control centre	TISPAN/3GPP
4.1.7	Preventing effects of discrepancies in coverage	TISPAN/3GPP
4.1.7.1	Radio Coverage Limit cases between mobile networks	TISPAN/3GPP
4.1.7.2	International cooperation	TISPAN/3GPP
4.1.7.3	Cordless technologies	DECT
4.2	Recognition and treatment of emergency calls by the originating network	TISPAN/3GPP
4.2.1	Emergency call-related information	TISPAN/3GPP
4.2.1.1	Calling line number of the access at which the emergency call is made	TISPAN/3GPP/AT
4.2.1.2	Indication of the emergency caller's location	TISPAN/3GPP
4.2.1.2.1	Emergency caller using a fixed line access	TISPAN/AT
4.2.1.2.2	Emergency caller using a mobile phone	MSG/3GPP
4.2.1.2.3	Indication of location in private networks.	AT/ECMA 32
4.2.1.3	Identification of the mobile terminal equipment	MSG/3GPP
4.2.2	Network identification	TISPAN/3GPP
4.2.3	Minimum power supply for user accesses	AT/Safety/EE
4.2.4	Over dialling	TISPAN/3GPP
4.2.5	Suppression of carrier selection /carrier preselection codes	TISPAN/3GPP
4.2.6	Emergency calls from other countries	TISPAN/3GPP
4.3new	Interconnect emergency calls	TISPAN/3GPP
4.3	Handling of emergency calls between networks	TISPAN/3GPP
4.4	Providing termination of emergency calls to the PSAP	TISPAN/3GPP
4.4.1	Features of emergency control centres	TISPAN/3GPP/AT
4.4.2	Release of the emergency call.	TISPAN/3GPP
4.4.3	Temporary Blocking of Emergency Calls from a particular source	TISPAN/3GPP
4.5	Emergency call-specific functions for all involved networks	TISPAN/3GPP (all)

Clause	Title	TB(s), other B(s) and rapporteurs
4.5.1	Priority of emergency calls	TISPAN/3GPP
4.6	Network Management support functions for delivery of Emergency calls to PSAPs	TISPAN/3GPP
4.6.1	Monitoring of the lines and availability of the PSAP	TISPAN/3GPP
4.6.2	Diversion of emergency calls	TISPAN/3GPP
4.6.3	Permanent availability	EE/TISPAN/3GPP (all)
4.6.4	Security provisions at access to PSAPs	TISPAN/3GPP/all
5	European-wide interface between operators and PSAPs	TISPAN/3GPP
6	Special requirements when making emergency calls by disabled, elderly and young users	HF/AT/USER
7	Special requirements for emergency calls in a foreign language	TISPAN/3GPP (all)
8	Data protection	OCG_security/ESI
9	Future and other networks	TISPAN/3GPP (all)
Annex A	Basic Architecture	TISPAN/3GPP
Annex B	Disabled, elderly and young users	HF
TISPAN: This is the working name of the new Technical Body resulting from the merger of EP TIPHON and TC SPAN.		

History

Document history		
V1.1.1	December 2003	Publication