COMMUNICATIONS ALLIANCE LTD

INDUSTRY GUIDELINE

G667:2021

MOBILE ORIGINATED ONE WAY EMERGENCY CALLS

G667:2021 Mobile Originated One Way Emergency Calls Industry Guideline

First published as G667:2021

Communications Alliance Ltd was formed in 1997 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

INTRODUCTORY STATEMENT

The **Mobile Originated One Way Emergency Calls** Guideline (G667:2021) is designed to:

- Identify scenarios where Emergency Calls are made from mobile Customer Equipment (CE) with an Identity Module that is not able to receive a return voice call; and

- Specify the arrangements for how the Emergency Call Person (ECP) for 000 and 112, Emergency Service Organisations (ESOs) and Mobile Carriers treat these Emergency Call scenarios.

James Duck
Chair
One Way Emergency Calls Working Committee

OCTOBER 2021

TABLE OF CONTENTS

1 GENERAL

1.1 Introduction

1.1.1 The development of the Guideline has been facilitated by Communications Alliance through a Working Committee comprised of representatives from the telecommunications industry.

1.1.2 The Guideline should be read in the context of other relevant codes, guidelines and documents.

1.1.3 The Guideline should be read in conjunction with related legislation, including:

(a) The *Telecommunications Act 1997* (the Act); and

(b) The *Telecommunications (Emergency Call Service) Determination 2019* (the Determination).

1.1.4 If there is a conflict between the requirements of the Guideline and any requirements imposed on a Carrier by statute, the Carrier will not be in breach of the Guideline by complying with the requirements of the statute.

1.1.5 Compliance with this Guideline does not guarantee compliance with any legislation. The Guideline is not a substitute for legal advice.

1.1.6 Statements in boxed text are a guide to interpretation only.

1.2 Scope

1.2.1 The Guideline applies to the Carrier sections of the telecommunications industry under section 110 of the Act.

1.2.2 The Guideline applies to:

(a) Mobile Carriers; and

(b) The Emergency Call Person (ECP) for 000 and 112.

1.2.3 The Guideline does not apply to:

(a) Emergency Service Organisations (ESOs);

(b) the ECP for 106; and

(c) CE vendors.

1.2.4 It deals with the following telecommunications activities, as defined in section 109 of the Act

(a) carrying on business as a Carrier; or

(b) supplying goods or service(s) for use in connection with the supply of a Listed Carriage Service.

1.2.5   The Guideline deals with Emergency Calls that:

(a)   Are from mobile CE that comply with AS/CA S042.1

(b)   Use 3GPP technologies designed for voice communications; and

(c)   Originate inside Australia.

1.2.6   The Guideline does not deal with Emergency Calls from mobile CE that:

(a)   Use a Satellite Service;

(b)   Are payphones that use a 3GPP technology; or

(c)   Do not use a PMTS; or

(d)   Use Voice over the Internet Protocol (VoIP) services that are PMTS but operate independently of a Mobile Carrier's voice core network (e.g. 'over the top' of an underlying mobile data service).

1.3   Objectives

1.3.1   The objectives of the Guideline are to:

(a)   Identify scenarios where mobile CE is used to make an Emergency Call with an Identity Module intended for one way communications e.g. a data-only SIM; and

(b)   Specify what may or may not be possible if an Emergency Call in these identified scenarios is subject to a:

(i)   Call dropout i.e. where it is likely that call back by an ESO will not be technically feasible; or

(ii)   Significant Network Outages i.e. Welfare Checks by Mobile Carriers or the Emergency Call Person (ECP) for 000 and 112 may be possible via SMS but voice calls are unlikely to work.

1.4   Guideline review

1.4.1   The Guideline will be reviewed every 5 years, or earlier in the event of significant developments that affect the Guideline.

2 ACRONYMS, DEFINITIONS AND INTERPRETATIONS

2.1 Acronyms

For the purposes of the Guideline:

3G

The third generation of mobile phone technologies covered by the ITU IMT family.

3GPP

3rd Generation Partnership Program.

4G

The fourth generation of mobile phone technologies covered by the ITU IMT family.

5G

The fifth generation of mobile phone technologies covered by the ITU IMT family.

ACMA

Australian Communications and Media Authority.

AML

Advanced Mobile Location.

CLI

Calling Line Identification.

ECP

Emergency Call Person.

eSIM

Embedded Subscriber Identity Module.

ESO

Emergency Service Organisation.

ETSI

European Telecommunications Standard Institute.

eUICC

Embedded Universal Integrated Circuit Card.

IM

IP Multimedia.

IMEI

International Mobile station Equipment Identity.

IMSI

International Mobile Subscription Identity.

IMT

International Mobile Telecommunications.

IoT

Internet of Things.

ISIM

IM Services Identity Module.

ITU

International Telecommunications Union.

ITU-T

International Telecommunications Union Telecommunication Standardization sector.

MNO

Mobile Network Operator.

MoLI

Mobile Location Information.

PLMN

Public Land Mobile Network.

PMTS

Public Mobile Telecommunications Service.

PEI

Permanent Equipment Identifier.

SIM

Subscriber Identity Module.

SMS

Short Message Service.

2.2 Definitions

For the purposes of the Guideline:

3GPP technologies

3GPP technologies as specified by ETSI and 3GPP.

Act

means the *Telecommunications Act 1997 (Cth)*.

Calling Line Identification

means the data generated by a Telecommunications Network which relates to the Public Number of the A-Party.

> *Note: A CLI delivered by a Mobile Carrier to the ECP for 000 and 112 may be in one of several formats, including a:*
> *(a) 9 digit national mobile number;*
> *(b) 10 digit national mobile number including a leading zero;*
> *(c) 10 digit national local number (e.g. for some fixed-to-mobile convergence voice telephony services); or*
> *(d) full 15 digit international number (e.g. a number for an international inbound roamer that is consistent with ITU-T Recommendation E.164).*
>
> *2. There may be cases where the CLI for an Emergency Call is not consistent with ITU-T Recommendation E.164 or the Telecommunications Numbering Plan 2015 e.g. calls from some international inbound roamers.*

Carriage Service Provider

has the meaning given by section 87 of the Act.

Carrier

has the meaning given by section 7 of the Act.

Customer Equipment

has the meaning given by section 21 of the Act.

Default CLI

has the meaning given by the Determination.

Determination

means the Telecommunications (Emergency Call Service) Determination 2019.

Emergency Call

has the meaning given by the Determination.

Emergency Call Person for 000 and 112

has the meaning given by the Determination.

Emergency Service Number

has the meaning given by section 30 of the *Telecommunications Numbering Plan 2015*.

Identity Module

means a Subscriber Identity Module (SIM), a Universal Subscriber Identity Module (USIM) or an IP Multimedia Services Identity Module (ISIM) or an Embedded Universal Integrated Circuit Card (eUICC) which is used in the authentication procedures and contains the subscriber identity as well as other subscriber data.

NOTE: *eUICC is commonly known as Embedded Subscriber Identity Module or eSIM.*

International Mobile station Equipment Identity (IMEI)

means a unique number which is allocated to each individual mobile station equipment in the Public Land Mobile Network (PLMN) and unconditionally implemented by the mobile station manufacturer at the time of manufacture.

Listed Carriage Service

has the meaning given by section 16 of the Act.

Mobile Carrier

means a Carrier that owns or operates a controlled network or controlled facility used to supply a Public Mobile Telecommunications Service (PMTS).

Non-genuine Call

has the meaning given by the Determination.

Permanent Equipment Identifier

means to identify a 5G CE by the network, comprising of a PEI type and an identifier dependent on the value of the PEI type.

Public Land Mobile Network

means a controlled network or controlled facility that is owned or operated by a Mobile Carrier to supply a PMTS.

Public Mobile Telecommunications Service

has the meaning given by the Act.

Public Number

means a number specified in the *Telecommunications Numbering Plan 2015*.

Satellite Service

has the meaning given by the Determination.

Significant Network Outage

has the meaning given by the Determination.

Subscriber Identity Module

means a physically removable module which is used in the authentication procedures and contains the subscriber identity as well as other subscriber data.

Welfare Check

has the meaning given by the Determination.

2.3 Interpretations

In the Guideline, unless the contrary appears:

(a) headings are for convenience only and do not affect interpretation;

(b) a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;

(c) words in the singular includes the plural and vice versa;

(d) words importing persons include a body whether corporate, politic or otherwise;

(e) where a word or phrase is defined, its other grammatical forms have a corresponding meaning;

(f) mentioning anything after include, includes or including does not limit what else might be included;

(g) words and expressions which are not defined have the meanings given to them in the Act; and

(h) a reference to a person includes a reference to the person's executors, administrators, successors, agents, assignees and novatees.

3 ONE WAY EMERGENCY CALL SCENARIOS

3.1 Introduction

3.1.1 Emergency Calls made from mobile Customer Equipment (CE) with an Identity Module that is not able to receive a return voice call are a concern for multiple reasons including:

(a) ESO inability to call back after an Emergency Call drops out.

(b) Mobile Carrier and ECP for 000 and 112 inability to perform Welfare Checks after a Significant Network Outage.

(c) Their use in Non-genuine Calls. This diverts resources of an ESO from responding to a genuine Emergency Call.

(d) Mobile Carrier inability to forward CE and service identifiers (e.g. IMEI, IMSI, CLI). These can assist ESOs to identify the caller and despatch resources in an efficient and timely manner.

3.2 Call Scenarios

3.2.1 Refer to Table 1 for Emergency Call scenarios where there is 'no' Identity Module, including scenarios equivalent to a SIM-less call.

TABLE 1
Emergency Call Scenarios with 'No' Identity Module

'No' Identity Module Scenarios	Service types / examples	Network response(s)
No Identity Module	SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
No eSIM	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
eSIM with no profile selected.	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Identity Module is blocked	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.

Identity Module is enabled with a personal identification number	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Identity Module is invalidated by the PLMN	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Identity Module is damaged or faulty	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Incorrect Identity Module	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Emergency camp-on	Equivalent to a SIM-less call	Emergency Call sent with Default CLI ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.
Unactivated Identity Module e.g. for in store prepaid	Equivalent to a SIM-less call	Emergency Call sent with Dummy CLI. ESO call back after dropout not possible. CE sends an IMEI/PEI to the PLMN.

3.2.2 Refer to Table 2 for service scenarios of one-way Emergency Calls.

3.2.3 Refer to G557.1, G557.2, G557.5 and G557.6 for more information on Mobile Location Information (MoLI) sent by Mobile Carriers such as SMSA-based MoLI, Push MoLI and Advanced Mobile Location (AML).

TABLE 2
Service Scenarios of One Way Emergency Calls

Service Scenarios	Service types / examples	Network response(s)
1. SMS only Identity Module Voice telephony service configured. **Bars non-emergency voice calls (inbound and outbound).** Emergency Calls permitted. May allow outbound voice calls to selected numbers e.g. customer care.	Banking authentication	CE registers on a PLMN. The Mobile Carrier will forward an Emergency Call to the ECP for 000 and 112. **ESO call back** is not technically possible. **Welfare Check by the Mobile Carrier or ECP for 000 and 112** is only possible via SMS. CLI sent from the PLMN to the ECP for 000 and 112 is the CLI associated with the SMS only Identity Module (i.e. not a Default CLI).

2. Data only Identity Module No voice telephony service configured. No SMS configured.	Dongles, modems e.g. IoT, M2M.	CE registers on a PLMN but not on the voice network of a PLMN. The Mobile Carrier will forward an Emergency Call to the ECP for 000 and 112. The Emergency Call may not have an AML short message associated with it (due to no SMS). **ESO call back** is not technically possible. **Welfare Check by the Mobile Carrier or ECP for 000 and 112** via voice or SMS is not technically possible. CLI sent from the PLMN to the ECP for 000 and 112 is: (a) the CLI associated with the Data only Identity Module or; (b) a Default CLI).
3. Data only Identity Module No voice telephony service configured. Incoming SMS configured. No outgoing SMS configured.	Dongles, modems e.g. IoT, M2M.	CE registers on the data network of a PLMN but not on the voice network of a PLMN. The Mobile Carrier will forward an Emergency Call to the ECP for 000 and 112. The Emergency Call may not have an AML short message associated with it (due to no outgoing SMS). **ESO call back** is not technically possible. **Welfare Check by the Mobile Carrier or ECP for 000 and 112** via voice or SMS is not technically possible CLI sent from the PLMN to the ECP for 000 and 112 is a Default CLI.

4. Data only		CE registers on a PLMN.
Voice and SMS service configured. **Bars non-emergency voice calls (inbound and outbound).** Emergency Calls permitted. May allow outbound voice calls to selected numbers e.g. customer care.	Older services that allow 3G data.	The Mobile Carrier will forward an Emergency Call to the ECP for 000 and 112. **ESO call back** is not technically possible. **Welfare Check by the Mobile Carrier or ECP for 000 and 112** is only possible via SMS. CLI sent from the PLMN: to the ECP for 000 and 112 depends on the service configuration, customer status and grace period(s). The Emergency Call may be sent with either the CLI associated with the Data only Identity Module or a Default CLI. Note: A data only service may be associated with a Public Number or a network specific number (which is not a Public Number). A service with a Public Number could result in either a Default CLI or the CLI associated with the Data only Identity Module being presented to the ECP for 000 and 112. A service with a network specific number will always present a Default CLI.
5. eSIM only		The network response will depend on the profile that is active. This could be one of up to seventy profiles. Refer to the scenarios above in this Table for the network response to various service combinations.

3.2.4   Refer to Table 3 for scenarios with multiple Identity Modules.

> *NOTE: This includes scenarios where CE has:*
> *(a) multiple physical Identity Modules.*
> *(b) one physical Identity Module and an eSIM (with one or more profiles); or*
> *(c)one eSIM with multiple profiles.*

TABLE 3
Scenarios with multiple Identity Modules

Scenarios with multiple Identity Modules	Service types / examples	Network response(s)
1. User or CE selects an Identity Module with a voice service	'Regular' Emergency Call.	**ESO call back** is possible. **Welfare Check by the Mobile Carrier or ECP for 000 and 112** is possible via voice or SMS.
2. User or CE selects an Identity Module without a voice service	One-way Emergency Call	The Mobile Carrier will forward an Emergency Call to the ECP for 000 and 112. **ESO call back** is not technically possible. Refer to Table 2 for the scenario of a single 'data only' SIM.
3. Both eSIM and physical Identity Modules available CE uses its default or 'preferred' eSIM profile.		CE uses its default or 'preferred' eSIM profile (e.g. 'default number' in iOS 13 or later). Refer to the service scenarios in Table 2 for the corresponding network response.
4. Both eSIM and physical Identity Module available. User selects eSIM profile		Refer to the service scenarios in Table 2 for the corresponding network response.
5. eSIM and physical Identity Module available. eSIM profile not selected	Effectively a single physical Identity Module case.	Refer to the service scenarios in Table 2 for the corresponding network response.
6. Multiple eSIM		Industry is not aware of a multiple eSIM scenario (e.g. one eSIM for a voice service, a different eSIM for a SMS) being in the market at present. This scenario might be possible in the future – for future study.

4   OTHER EMERGENCY CALL SCENARIOS

4.1   Introduction

4.1.1   There are some Emergency Call scenarios where it may not be possible for a call back by an ESO or a Welfare Check by a Mobile Carrier or the ECP for 000 and 112.

4.1.2   In these scenarios there are variable conditions that will determine whether the ECP for 000 and 112 receives a one-way Emergency Call or a more 'regular' Emergency Call (where ESO call back is possible), which in turn will likely change the outcome if there is a need for an ESO call back.

4.1.3   Examples of these scenarios include:

(a)   Automotive emergency response systems, often referred to as 'eCall' systems which accesses a PMTS; and

(b)   Secondary devices which accesses a PMTS e.g. some medical alarms and smart watches.

4.2   eCall Systems

4.2.1   An eCall or automotive emergency response systems might:

(a)   Initiate an Emergency Call direct to the ECP for 000 and 112 e.g. after sensing an abnormal operating condition, such as a sudden reduction in velocity;

(b)   Initiate communication with a concierge service that then contacts the ECP for 000 and 112 and relays received information such as latitude and longitude; or

(c)   Be fitted with a data only Identity Module, which might permit an outbound call but ESO call back via voice or SMS is not technically possible.

NOTES:

1. Examples of an in-vehicle communications system which could access a PMTS are:

(a) a standalone mobile service, which may use an international mobile number, or

(b) a system that pairs with the CE in the vehicle to access a PMTS.

2. Where an international number is used in-vehicle to access a PMTS, an Emergency Call might:

(a)appear to be from an international inbound roamer when sent direct to the ECP for 000 and 112. In this scenario an ESO call back might be possible if the eCall service uses a voice capable

Identity Module and is registered on a PLMN but not if the Emergency Call was via emergency camp-on.

(b) be relayed from a concierge service e.g. via an IP gateway if the service operates outside Australia. This might be presented to the ECP as an out of area call.

3. For additional technical information on eCall refer to the IETF RFC on Session Description Protocol (SDP) Offer/Answer Examples (IETF RFC 4317)).

4. For additional technical information on an 'automotive emergency response system' refer to ITU T Recommendations Y.4119, Y.4468 and Y.4467.

4.3 Secondary Mobile Devices

4.3.1 Secondary mobile devices (e.g. some medical alarms and smart watches) can initiate an Emergency Call to the ECP for 000 and 112 by accessing a PMTS after detecting a fall and then either:

(a) Confirming the need for an Emergency Call; or

(b) Receiving no further response from the user.

NOTES:

1. When a secondary device initiates an Emergency Call by accessing a PMTS the CLI delivered to the ECP for 000 and 112 may be the same CLI or a different CLI to that for the primary mobile device.

2. One example is the absence of an Identity Module in the secondary mobile device and where it would use the Identity Module, and therefore the CLI of the primary mobile device e.g. a SIM-less Apple Watch with Bluetooth RF interface to an Apple iPhone.

3. This also depends on the model of secondary mobile device e.g. a smart watch may be able to have its own eSIM or physical Identity Module.

5 REFERENCES

Publication	Title
AS/CA Standards	
AS/CA S042.1:2020	Requirements for connection to an air interface of a Telecommunications Network— Part 1: General
	https://www.commsalliance.com.au/Documents/all/Standards/s042.1
Industry Codes	
C536:2020	Emergency Call Service Requirements Industry Code (incorporating Amendment No.1/2015)
	https://www.commsalliance.com.au/Documents/all/codes/c536
Industry Guidelines	
	Location Information for Emergency Calls
G557.1:2021	Part 1: Index
G557.2:2014	Part 2: Standardised Mobile Service Area (SMSA) and Location Indicator Register
G557.5:2021	Part 5: Push Mobile Location Information (MoLI) Interface to Emergency Call Person Platform (ECPP) Industry Specification
G557.6:2021	Part 6: Advanced Mobile Location (AML)
	https://www.commsalliance.com.au/Documents/all/guidelines/g557
IETF RFCs	
IETF RFC 4317	Session Description Protocol (SDP) Offer/Answer Examples
	https://www.rfc-editor.org/info/rfc4317
ITU-T Recommendations	
E.164 (11/2010)	The international public telecommunication numbering plan
	https://www.itu.int/itu-t/recommendations/rec.aspx?rec=10688

Y.4119 (03/2018)	Requirements and capability framework for IoT-based automotive emergency response system
	https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13497
Y.4467 (01/2020)	Minimum set of data structure for automotive emergency response system
	https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14170
Y.4468 (01/2020)	Minimum set of data transfer protocol for automotive emergency response system
	https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14171

Legislation

Telecommunications Act 1997

https://www.legislation.gov.au/Series/C2004A05145

Telecommunications (Emergency Call Service) Determination 2019

https://www.legislation.gov.au/Series/F2019L01509

Telecommunications Numbering Plan 2015

https://www.legislation.gov.au/Series/F2015L00319

PARTICIPANTS

The Working Committee that developed the Guideline consisted of the following organisations and their representatives:

Organisation	Membership	Representative
Optus	Voting	James Dam
Optus	Non-voting	Sam Mangar
Telstra	Voting	Jane Elkington
Telstra	Non-voting	Kandiah Arulventhan
Telstra	Non-voting	Kirk Pascoe
Telstra	Non-voting	Michael Ryan
Telstra	Non-voting	Dilpreet Singh
Telstra	Non-voting	Bob Spencer
TPGT	Voting	Alexander Osborne
TPGT	Non-voting	Angus Clearie
TPGT	Non-voting	Annie Leahy
TPGT	Non-voting	Michael Ziegelmann

This Working Committee was chaired by James Duck of Communications Alliance who also provided project management support.

Communications Alliance was formed in 1997 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

In pursuing its goals, Communications Alliance offers a forum for the industry to make coherent and constructive contributions to policy development and debate.

Communications Alliance seeks to facilitate open, effective and ethical competition between service providers while ensuring efficient, safe operation of networks, the provision of innovative services and the enhancement of consumer outcomes.

It is committed to the achievement of the policy objective of the *Telecommunications Act 1997* - the greatest practicable use of industry self-regulation without imposing undue financial and administrative burdens on industry.