

**Department of Communications  
Energy and Natural Resources**

**Mobile Location  
Information**

**Provided in association  
with  
an Emergency Call**

**Part I – Transfer**

**Issue 5.1**

**Document No.**

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V2.1	Updated Value to be used where LAC is not available	BT	5 June 2009
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Draft 5.0	Updated to include special cell details to be used for Wi-Fi originated emergency calls	BT	24 <sup>th</sup> June 2019
Issue 5.1	Updated to include recommendation on selection of Vo-WiFi where available for carrying emergency calls. Raised to Issue.	BT	17 <sup>th</sup> September 2020

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## 1 Purpose of this Specification

This document describes the method of transferring mobile location information from a mobile network to the Emergency Call Answering Service (ECAS) in Ireland, for the purpose of handling an Emergency Call.

Where appropriate, mobile location information may be further transferred from the ECAS to the Emergency Services in association with an Emergency Call.

The mobile location information transferred is the Cell Global Identification for 2/3G, and LTE mobile Cells. In addition, a specific reserved Cell Identifier to be used where the mobile emergency call is being carried over VoIP/Wi-Fi is also described.

Part 2 of this specification (the "Conversion" specification) addresses the information required for the conversion of Cell Global Identification (CGI) to geo-coordinates which is provided to the ECAS by the mobile network operator for all possible mobile cells which could be used to originate an emergency call.

## 2 Scope of this Specification

As the network identification elements of the Cell Global Identification may also be used by a transit operator (eg. eir) for the identification of the network originating an Emergency Call, these elements will replace the current network suffixes specified in eir's Reference Interconnect Offer<sup>1</sup>. See Section 5.

This specification shall cover all Emergency Calls from mobile networks.

Mobile operators shall implement this specification whether or not they provide mobile caller location information or any other techniques or methods to identifying a callers location.

## 3 Originating Cell Identification

### 3.1 Cell Global Identification standard

The Cell Global Identification shall comply with appropriate ETSI standards.

### 3.2 Cell Global Identification structure

#### 3.2.1 2/3G Mobile Cells

The 2/3G Mobile location information structure is as follows:

MCC-MNC-LAC-CI where:

MCC is the Mobile Country Code (272 for Ireland)

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<sup>1</sup> See Section 5.3 of Eir – OAO Interconnect Network Plan

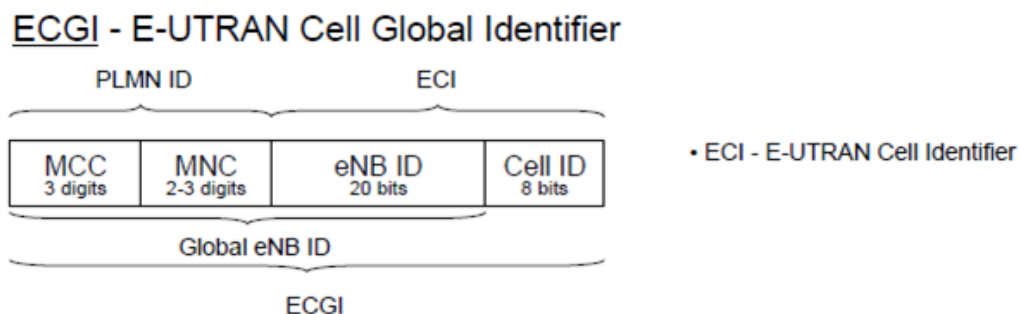
MNC is the Mobile Network Code

LAC is the Location Area Code

CI is the Cell Identity

### 3.2.2 LTE Mobile Cells and CGI

The LTE Cell Global Identifier (CGI) is shown in the following diagram



MCC – As for 2/3G networks and is expected to have the value ‘272’ for all Irish mobile network operators

MNC – 2 digits to be used and should be consistent with the 2/3G mobile network code used by each operator.

eNB ID – 7 Digits

Cell ID – 3 Digits

### 3.3 VoIP/Wi-Fi originated Emergency calls

In the case where an emergency call is carried over a Wi-Fi or other IP network and does not use a traditional mobile cell (with a fixed, known location) it is not possible to convey any information on the callers approximate location to the ECAS.

Mobile network operators should ensure that where Emergency calls are enabled over VoIP/Wi-Fi networks that an alternate means of providing caller location is enabled or can be expected to function on the handset – e.g. AML.

It is important to indicate to the ECAS and the Emergency Services at the time of the Emergency call that the conventional mobile cell location information is not expected to be available. This fact should be indicated to the ECAS by including a specific reserved Cell ID string as described below with the Mobile emergency call as connected to the ECAS.

Field	Emergency Shortcode	MCC	MNC	Wi-Fi Call identifier
Digits	3	3	2	10
Example	112 999 997 991 992	272	07	65533 65534
B-Number	112272076553565534			

Mobile network operators should include this special cell identifier in the Cell details provided to ECAS as described in the Mobile Location Conversion Specification (v5.1) so as to ensure that emergency calls received by the ECAS which utilise VoIP or VoWiFi are correctly identified and associated with that mobile network operator. Due to the process used for the upload of mobile cell details to the ECAS which involves the replacement of existing cell records for a given operator (as described in the Data Transfer Specification) it is not possible for ECAS to add this special cell to the database separately and it needs to be included with the full upload by each mobile network operator.

### 3.4 Emergency calls using Wi-Fi calling

With the introduction of Voice over WiFi capabilities on mobile networks and devices in Ireland, this introduces further capability and options for carrying an Emergency call. It is important to make the distinction between the WiFi Calling service offered by a given mobile network operator to its customers on supported mobile devices and other Over The Top (OTT) VoIP services which may be used on a mobile device through a Third party VoIP app or client.

Wi-Fi calling services can be considered to be fully managed and approved as a reliable means of communication by the mobile network operator and are only enabled by the Mobile network operator for its individual subscribers on supported devices. Wi-Fi Calling can be considered as an alternate transport or carrier layer for the customers calls when the cellular network is not available. As a result Wi-Fi calling can be assumed to be a reliable and verified calling method similar to the traditional transport of a mobile call on the operators cellular network.

Wi-Fi Calling is fully integrated with the dialer or OS calling functions on the supported mobile device and the call is carried by the Mobile network operators voice switch infrastructure. The calling number used is the customers allocated mobile number which distinguishes the service from OTT VoIP services which may utilise any telephone number from a third party VoIP provider. In this regard, the mobile network operator is responsible for the transport of emergency calls made in this manner up to the point where they are routed to the ECAS or an intermediary carrier (Transit).

## 4 Coding of Mobile Location Information in the B Number

When connecting an Emergency Call to the ECAS, Cell ID must be supplied with the call by means of appending the Cell ID and LAC digits to the B-Number, or called number of the Emergency Call.

In appending the Cell ID information to the B-Number for the Emergency call, operators should ensure that the required digits are appended to the number *directly following* the 112 or 999 shortcode.

Any extra digits dialled by the caller following the 112 or 999 shortcode should be stripped from the B-Number by the mobile network operator prior to appending the Cell ID digits. This means that B-Number for all Emergency calls presented to the ECAS should be exactly 18 digits as described in this specification.

### 4.1 Digits sent where mobile location information is available from a 2/3G Cell

The following B-number shall be sent from a mobile network to the ECAS when an Emergency Call is being made using a 2/3G Cell and location information is available:

V	V	V	W	W	W	X	X	Y	Y	Y	Y	Y	Z	Z	Z	Z	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Where the digits have the following meaning:

	Meaning	Digits	Coding	Value	Notes
VVV	Emergency Number	3	decimal	112	Fixed
WWW	Mobile Country Code	3	decimal	272	Fixed
XX	Mobile Network Code	2	decimal	01 - Vodafone, 02 - O2 03 - Meteor 05 - H3GI	Or other values assigned by ComReg.
YYYYY	Location Area Code	5	decimal	1 to 65532 Set by mobile operator	
ZZZZZ	Cell Identity	5	decimal	1 to 65533 Set by mobile operator	
	Total	18			

Note 1: Decimal fields should be padded with zeros from the left, if necessary.

**Table 1: B-Number where mobile location information is available from 2/3G Cell**

**Example**

112 272 01 03011 32400 (spaces are included for clarity)

**4.2 Digits sent where mobile location information is available from an LTE Cell**

The following B-number shall be sent from a mobile network to the ECAS when an Emergency Call is being made using an LTE Cell and location information is available:

V	V	V	W	W	W	X	X	Y	Y	Y	Y	Y	Y	Y	Z	Z	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Where the digits have the following meaning:

	Meaning	Digits	Coding	Value	Notes
VVV	Emergency Number	3	decimal	112	Fixed
WWW	Mobile Country Code	3	decimal	272	Fixed
XX	Mobile Network Code	2	decimal	01 - Vodafone, 02 - O2 03 - Meteor 05 - H3GI	Or other values assigned by ComReg.
YYYYYYY	eNB ID	7	decimal	1 to 1048575 Set by mobile operator	7 Digits representing the LTE eNB ID (20 bits)

ZZZ	Cell Identity	3	decimal	1 to 255 Set by mobile operator	3 Digits representing the LTE Cell Identity (8 bits)
	Total	18			

Note 1: Decimal fields should be padded with zeros from the left, if necessary to fill the required number of digits.

**Table 2: B-Number where mobile location information is available from LTE Cell**

**Example**

112 272 01 1234567 123 (spaces are included for clarity)

**4.3 Digits sent where the call is carried over VoIP/Wi-Fi**

The following B-number shall be sent from a mobile network to the ECAS when an Emergency Call is being made, using Wi-Fi calling:

V	V	V	W	W	W	X	X	Y	Y	Y	Y	Y	Z	Z	Z	Z	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Where the digits have the following meaning:

	Meaning	Digits	Coding	Value	Notes
VVV	Emergency Number	3	decimal	112	Fixed
WWW	Mobile Country Code	3	decimal	272	Fixed
XX	Mobile Network Code	2	decimal	01 - Vodafone, 02 - O2 03 - Meteor 05 - H3GI	Or other values assigned by ComReg.
YYYYY	Location Area Code	5	decimal	65533	LAC not provided or unavailable.
ZZZZZ	Cell Identity	5	decimal	65534	CI not provided or unavailable.
	Total	18			

Note 1: Decimal fields should be padded with zeros from the left, if necessary.

**Table 2: B-Number where Emergency call is made using Wi-Fi Calling**

**Example**

112 272 01 65533 65534 (spaces are included for clarity)

**4.4 Digits sent where mobile location information is not provided or unavailable**

The following B-number shall be sent from a mobile network to the ECAS when an Emergency Call is being made, and location information is not provided or unavailable:

V	V	V	W	W	W	X	X	Y	Y	Y	Y	Y	Z	Z	Z	Z	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



Where the digits have the following meaning:

	Meaning	Digits	Coding	Value	Notes
VVV	Emergency Number	3	decimal	112	Fixed
WWW	Mobile Country Code	3	decimal	272	Fixed
XX	Mobile Network Code	2	decimal	01 - Vodafone, 02 - O2 03 - Meteor 05 - H3GI	Or other values assigned by ComReg.
YYYYY	Location Area Code	5	decimal	00000	LAC not provided or unavailable.
ZZZZZ	Cell Identity	5	decimal	00000	CI not provided or unavailable.
	Total	18			

Note 1: Decimal fields should be padded with zeros from the left, if necessary.

**Table 3: B-Number where mobile location information is not provided or unavailable**

**Example**

112 272 01 00000 00000 (spaces are included for clarity)

## 5 Network Suffixes

The network suffix for an Emergency Call is given by digits WWWXX of the B-number:

V	V	V	W	W	W	X	X	Y	Y	Y	Y	Y	Z	Z	Z	Z	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

The implementation of this specification will result in the existing network suffixes used for Emergency Calls<sup>2</sup> from mobile networks being replaced by the suffixes given in the Table 3 below.

Suffix	Operator
WWWXX	
27201	Vodafone,
27202	O2
27203	Meteor
27205	H3GI

Table 4: Network suffixes for Emergency Calls from mobiles

## 6 Implementation issues

1. Transit networks, including eir's, will need to be modified to handle the new Emergency Call digits.
2. Mobile operators are unlikely to be using the LAC and CI values of 00000, 65533, 65534 or 65535, however if allocated, the values would need to be changed to comply with this specification.

**End of Document**

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<sup>2</sup> Network suffixes are used by eir to determine the originating network for an emergency call.