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DISSEMINATION LEVEL		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
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		Submission date:	14/01/09

CONTENTS

1	INTRODUCTION.....	3
1.1	PROJECT SCOPE.....	3
1.2	PURPOSE OF THE DOCUMENT.....	3
1.3	DOCUMENT VERSIONS SHEET.....	3
2	REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS.....	4
2.1	REFERENCE DOCUMENTS.....	4
2.2	ABBREVIATIONS.....	4
3	EXECUTIVE SUMMARY.....	5
4	THE CITIZEN'S PERSPECTIVE.....	6
4.1	INTRODUCTION.....	6
4.2	THE IDEAL SITUATION IN MOBILE TERMINALS.....	6
4.2.1	<i>The alert tone.....</i>	6
4.2.2	<i>Displaying the message.....</i>	6
4.2.3	<i>Multilingual aspects.....</i>	6
4.2.4	<i>Configuration.....</i>	7
4.2.5	<i>Message Identifier (channel).....</i>	7
4.3	PUBLIC WARNING IN DIGITAL AUDIO BROADCAST.....	7
4.4	PUBLIC WARNING IN DIGITAL VIDEO BROADCAST.....	7
5	THE STANDARDS PERSPECTIVE.....	9
5.1	INTRODUCTION.....	9
5.1.1	<i>Message identifier.....</i>	9
5.1.2	<i>The Presidential Message.....</i>	9
5.1.3	<i>Multilingual aspects.....</i>	10
5.1.4	<i>Broadcasting warning messages.....</i>	10
5.1.5	<i>Mobile Device Specifications in CMAS.....</i>	10
ANNEX I	: DATA CODING SCHEME.....	11

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

1 INTRODUCTION

1.1 PROJECT SCOPE

The CHORIST project will propose solutions to increase rapidity and effectiveness of interventions following natural hazards and industrial accidents, in order to enhance citizens' safety and communications between rescue actors.

1.2 PURPOSE OF THE DOCUMENT

Public warning messages are different from normal messages: warning messages have a high priority, a high urgency, and may be broadcast in various languages, and should foremost be intrusive and urge the citizen to perform the required action. Public warning messages should not be ignored or mistaken for normal messages.

Currently, mobile terminals do not make a distinction between both message types, and multi-lingual aspects require further consideration.

Radio and television broadcast in a particular language and warning messages will be in the same language as in which the station is broadcasting. Listeners and viewers may understand the warning message better if it was broadcast in their preferred language. This aspect may also be relevant for visitors to a country.

This document discusses these issues and proposes possible solutions. The way to get towards any of these solutions is not trivial and there are various other solutions, none of them ideal. An implementation may depend on local regulations or political decisions.

1.3 DOCUMENT VERSIONS SHEET

Version	Date	Description, modifications, authors
1.0	27-07-08	Initial version, P. Sanders
1.0.1	06-10-08	Second draft version, P. Sanders
1.0.2	07-10-08	Updated Executive Summary and included comments
1.0.3	08-10-08	Editorial changes
1.0	14-01-09	Release

Table 1 : Document versions sheet

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

2 REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS

2.1 REFERENCE DOCUMENTS

- [1] 3GPP TS 23.038, "Alphabets and language-specific information", V8.1.0
[2] ISO 639-1, "Codes for the representation of names of languages"

2.2 ABBREVIATIONS

3GPP	Third Generation Partnership Programme.
ATIS	Alliance for Telecommunications Industry Solutions
MDS	Mobile Device Specification
OTA	Over-The-Air
TIA	Telecommunications Industry Association
UCS-2	2 byte Universal Character Set

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

3 EXECUTIVE SUMMARY

Warning messages are intended to make the citizen take the required action. For that to happen the message shall be understood. On the one hand shall a warning message be recognizable as a warning message, and not be mistaken for a normal message, and on the other hand shall the text of the message be clear to the citizen. Presenting the message in a language that is understood by the citizen would make a huge difference.

This document discusses some solutions how messages can be broadcast in multiple languages and how the message in the preferred language can be displayed. The topic is treated from a technical perspective and from a standards perspective.

The ultimate solution has a very high political character and may differ per country if this issue is not dealt with appropriately.

- A message is recognized as a warning message when it has a dedicated alert tone that cannot be mistaken for a normal message.
- Through a configuration item the preferred language can be selected. If the preferred language is not broadcast, the message is displayed in the local language.
- For mobile devices a second preferred language is defined.
 - When the message is broadcast in the first preferred language, only the message in this language will be displayed (which should normally be the case when the citizen is in his home country).
 - When the message is not broadcast in the first preferred language, the message is displayed in the second preferred language (this could for instance be English when a citizen is travelling abroad).
 - When the message is neither broadcast in the first or the second preferred language, then the message will be displayed in the local language (so as indicate that there is a warning out).

In the case the Cell Broadcast technology is used, warning messages can all be broadcast on a single channel (Message Identifier is the appropriate word here) or each language is assigned its own channel. Pros and cons are discussed in this document, but in either case global standardization would have huge advantages for cross border travellers.

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

4 THE CITIZEN'S PERSPECTIVE

4.1 INTRODUCTION

Section 4.2 describes the ideal situation for the citizen for receiving and displaying public warning messages in multiple languages on a mobile terminal. Section **Erreur ! Source du renvoi introuvable.** discusses the situation for digital radio and section 4.4 in digital television channels.

It should be clear that the ideal situation is currently not achieved, and that the definition of ideal is what is perceived as ideal by the author.

4.2 THE IDEAL SITUATION IN MOBILE TERMINALS

If a public warning service using cell broadcast is offered in a country, the citizen should have an option to opt-in and opt-out of the service. This means that it should be possible to configure the warning service, preferably in a user-friendly manner, or that the service has been factory enabled.

Once the service has been activated, the citizen expects that

- Warning messages are intrusive. It should not be possible (for the citizen) to think that a normal message has been received rather than a warning message.
- Warning messages will have priority over other messages. Once a warning message has been received, it should not be overwritten by a regular message.
- If warning messages are broadcast in various languages, only the messages in the preferred language should be displayed.
- When the citizen visits another country that also offers a public warning service over cell broadcast, it should not be necessary for the user to modify the configuration.
- When messages happen to be broadcast in the preferred language, only those should be displayed. When that is not the case, only messages in the secondly preferred language should be displayed. If this language is not offered either, then messages in the language of the visited network should be displayed.

An example that may explain this further is given in section 4.2.3.

4.2.1 The alert tone

A public warning message should be intrusive at all times. This means that the ring tone must be specific for the public warning service and cannot be mistaken for a normal message. Furthermore, this ring tone should be loud, even when the terminal is set to silent mode. Being discrete is not a wise option when lives are at stake! However, care should be taken when the citizen is connected through a head set.

It shall be noted that in many countries it will be left to the user to set the volume, and the user may opt to set the terminal to silent mode.

It should not be possible to allocate the warning ring tone to other services. Due to the loudness of the ring tone bystanders could get the impression that a warning message is being broadcast when there is not.

4.2.2 Displaying the message

A warning message should pop up on the display immediately, as a class 0, normal display message. It should not be necessary to click a key first to retrieve the message.

4.2.3 Multilingual aspects

Warning messages can be broadcast in several languages. This will be a necessity in countries that have more than one official language. Other countries may want to be able to warn visitors. When the terminal is

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

configured for initial use, also the languages for the public warning messages should be selected (a language filter). When nothing is selected, the default language would be the language of the menu of the terminal. It should be possible to change the language. There should also be a secondly preferred language. The default for that language could be English; because it may well be that many countries will broadcast messages in English, next to the national language. For English speaking countries the situation could be different.

An example may clarify the language issue: A Dutch citizen in the Netherlands would like to receive messages in Dutch only, even if English messages are being broadcast too. In Belgium, this citizen would like to receive messages in Dutch. If this Dutch citizen visits for instance Spain, and assuming that Spain doesn't broadcast warning messages in Dutch, then messages in the secondly preferred language shall be displayed, which could be English. If English is not offered in Spain, then Spanish messages should at least give an idea that something is very urgent (assuming that this Dutch citizen doesn't understand Spanish). Obviously, there should be no need for the user to change the configuration when a border is being crossed. Only an initial configuration is acceptable.

4.2.4 Configuration

The correct (and default) setting for public warning should be configured by the vendor. The public warning service should be activated by default. It would be good if the configuration could be downloaded onto the terminal through OTA (Over-The-Air activation). Currently not all terminals are capable of downloading such settings over OTA. Activation of cell broadcast is currently not even possible through OTA.

The above statement suggests that it shall be possible to activate the CB service through OTA. Currently this is not possible. The CB service can only be activated from the menu on the terminal.

Activating the cell broadcast service over OTA is subject to regional legislation or operator policy.

It might be good if the default setting for public warning on the terminal could be configured through a manual code such as *#920# for instance.

4.2.5 Message Identifier (channel)

Cell broadcast messages have a message identifier, often, but erroneously, called channel. For the public warning service a Message Identifier should be agreed upon. It would be very advantageous if all countries in the world that deploy a public warning service over cell broadcast would use the same message identifier for the public warning service. It would then not be necessary to change any settings when crossing the border into another country.

A prerequisite for this is that the language filter in the terminal, as discussed above, is operational in order to prevent that several messages in different languages are displayed.

3GPP TS 22.268, Public Warning System Requirements contains the requirement that when a terminal has been configured to receive warning messages in the home network, and the user roams in another network which also offers public warning services (PWS), then the terminal shall also be able receive warning messages. A solution for this requirement shall be developed later in 2009.

4.3 PUBLIC WARNING IN DIGITAL AUDIO BROADCAST

Generally radio stations broadcast in a particular language. Since warning messages in CHORIST will be inserted into the audio stream, there is no possibility to choose languages. It seems likely that a listener to a radio station will understand the language that is used on the station.

4.4 PUBLIC WARNING IN DIGITAL VIDEO BROADCAST

Warning messages in digital television in CHORIST are made location specific through configuration of the postal code in the set-top box. It could then also be possible to set the preferred language.

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

This may not seem useful to citizens, but more so to visitors to the country. However, these visitors are not going to configure set-top boxes in their hotel rooms. The reception desk may be able to configure the setting when they enter the welcome message which is often displayed on television sets in hotel rooms.

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

5 THE STANDARDS PERSPECTIVE

5.1 INTRODUCTION

Most of the issues which are discussed in the previous chapter concern settings and functionality on the terminal. However, the message identifier, the multilingual aspects, and the cell broadcast warning message itself may have implications on the broadcast side, which need further discussion.

5.1.1 Message identifier

A message identifier must be allocated to the public warning service. There seem to be two ways to approach this; one is to allocate one single message identifier to the warning service and broadcast messages in all languages using this single message identifier, or to allocate a range of message identifiers, one for each language. Of course, if each language is allocated to a message identifier it would be preferred if this would be the same all over the world (each country that offers warning messages in English should use the same message identifier).

Allocating a message identifier per language still requires the language filtering. After all, a Dutch citizen in the Netherlands wants to receive a warning message in Dutch, but not the one in English if that language is also offered. Once this citizen crosses a border, and Dutch messages are no longer offered, the English message should be displayed, without having to reconfigure the phone once the border has been crossed.

Conclusion 1 is that the intelligent language filter is needed to solve language problems.

Once the choice has been made for the single Message Identifier, it is no longer needed to use different message identifiers, which makes cumbersome standardization across the world unnecessary.

Conclusion 2 is that the only one single message identifier is needed to broadcast warning messages.

It shall be noted that some countries may want to broadcast messages in different levels, such as levels of urgency or severity. This would require more than one message identifier for each language.

5.1.2 The Presidential Message

The Warning, Alert and Response Network (WARN) Act, signed by president Bush on 12 October 2006, in which the US Emergency Alert System shall be extended into the cellular network, has a clause which states that it shall not be possible to opt-out of the presidential message. With cell broadcast technology this can be achieved by allocating a message identifier above 999 to the presidential message. Message identifiers above 999 cannot be deselected from the menu of the terminal.

In current terminals it is still possible to deactivate the entire cell broadcast service.

Conclusion 3 is that if it shall be impossible to opt out of the presidential message then it shall be made impossible to deactivate the cell broadcast functionality on the terminal.

The WARN Act does not extend to the EU member states, but it may be that as a consequence of this Act, mobile devices may have the possibility, in future, to have Cell Broadcast activated from the factory without the possibility to deactivate it. This will undoubtedly be subject to regional legislation or operator policy.

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

5.1.3 Multilingual aspects

Messages can be broadcast in various languages. However, the terminal shall be told which language is used in the message, so the (currently already available) language filter on the terminal can select only the messages that shall be displayed. According to 3GPP TS 23.038, "Alphabets and language-specific information" [1], the Data Coding Scheme parameter shall be used for this purpose. Twenty-one languages have been defined in the specification. Other languages can be selected by preceding the message with a language code, using either the default 7-bit character set or UCS-2 characters. The correct use of the Data Coding Scheme is an implementation issue of the cell broadcast service centre.

The intelligent language filter, as discussed in section 4.2.3, requires that the terminal filters out the required message (in the required language). This is an implementation issue which needs further attention from terminal vendors.

5.1.4 Broadcasting warning messages

A terminal shall display warning messages differently from normal messages; an intrusive alert tone (see 4.2.1) and the message shall be shown on the display immediately (see 4.2.2). There seem to be two ways to make the distinction between a normal message and a warning message. One is to use a specific Message Identifier (or a whole range) only for public warning messages. When messages are received with such a specific Message Identifier, they should be treated as warning messages. A second way is to use a message parameter, such as the Data Coding Scheme, to indicate that the message is a warning message.

Using a (range of) message identifier for this purpose has the disadvantage that each country that uses this service should use these message identifiers; especially if a whole range is used to solve the language issue on a short notice, there is a chance that message identifiers are going to be different for the same language across countries.

Determining if a message is a warning message on the broadcast side doesn't have these disadvantages.

5.1.4.1 The Data Coding Scheme

Changing the Data Coding Scheme, so it includes an identifier for warning messages, means that the technical specification 3GPP TS 23.038 [1] will have to be modified. A possible solution is discussed in more detail in Annex A.

In this solution, the first three characters of the message are a two-character representation of the language encoded according to ISO 639-1 [2], followed by a CR character. The CR character is then followed by 90 characters of text.

5.1.5 Mobile Device Specifications in CMAS

The Commercial Mobile Alert Service (CMAS) is set up in the United States as a result of the WARN Act (see section 5.1.2). One of the objectives of CMAS is to define a set of requirements for the behaviour of the mobile devices whenever a CMAS emergency alert is received. A joint ATIS and TIA committee has developed a Mobile Device Specification (MDS), which will be published early 2009. This specification defines a common set of requirements for GSM, UMTS, and CDMA based mobile devices. Implementation of the requirements contained within that specification is mobile device manufacturer dependent. However, a common set of requirements will allow for a consistent user experience.

This CHORIST document is generally consistent with the requirements as listed in the MDS; be it that the MDS requires that initially English shall be the only supported language.

Project:	CHORIST	Deliv. ref.:	SP3.D16
EC contract:	033685	Deliv. title:	Multilingual aspects in Public Warning
		Deliv. version:	1.0
		Submission date:	14/01/09

ANNEX I : DATA CODING SCHEME

Although the main body of the document only discusses public warning messages, the proposed solution in this appendix does offer the possibility to define three levels of warnings:

- 1 - emergency alert messages
- 2 - warnings
- 3 - notifications

An emergency alert message could be a message that instructs people to evacuate an area. A warning could be a message that instructs people that public transport is not available at the railway station due to power failure, and that busses are available instead. A notification could be a message that reminds citizens to use their right to vote on a particular election day.

Especially the first two types of messages require a different, recognisable ring tone. The highest priority ring tone could be a ring tone at the loudest volume the phone can produce and that can only be switched off by pressing a key (with a maximum of one minute). The second type of message, the warning, could be recognized by the fact that the ring tone is at normal volume level, but can only be stopped by pressing a key (with a maximum of 30 seconds). The notification type could be like a normal message.

It may also be possible to use a different ring tone for all these type of messages, such as a police siren.

The phone should be able to recognize that the message is a public warning message. Proposed is to assign a few Data Coding Schemes for this purpose.

Bits 7 to 4 are 1000

Bits 3 to 0 are:

- 0001 notifications using GSM 7 bit default alphabet
- 0010 warnings using GSM 7 bit default alphabet
- 0011 emergency alerts using GSM 7 bit default alphabet
- 0101 notifications using UCS2 coding
- 0110 warnings using UCS2 coding.