ETSI TS 122 268 V10.1.0 (2011-10)

Technical Specification

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Public Warning System (PWS) requirements
(3GPP TS 22.268 version 10.1.0 Release 10)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

Reference

RTS/TSGS-0122268va10

Keywords

GSM,UMTS

ETSI

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Foreword

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The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

This Technical Specification defines the stage one description of the Public Warning System (PWS) Requirements. Stage one is the set of requirements seen primarily from the users" and service providers" points of view.

The scope of this TS covers the core requirements for the PWS that are sufficient to provide a complete service. This TS also covers subsystem additional requirements for the Earthquake and Tsunami Warning System (ETWS) and the Commercial Mobile Alert System (CMAS).

This TS includes information applicable to network operators, service providers, terminal and network manufacturers, in case of deployment of PWS, ETWS, and or CMAS. PWS, ETWS and CMAS deployment depends on operator decision or national regulations.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   FCC 08-99: "Federal Communications Commission First Report and Order In the Matter of The Commercial Mobile Alert System"; April 9, 2008.

[2]   FCC 08-164: "Federal Communications Commission Second Report and Order and Further Notice of Proposed Rulemaking In the Matter of The Commercial Mobile Alert System"; July 8, 2008.

[3]   FCC 08-184: "Federal Communications Commission Third Report and Order and Further Notice of Proposed Rulemaking In the Matter of The Commercial Mobile Alert System"; August 7, 2008.

[4]   J-STD-100: "Joint ATIS/TIA-CMAS Mobile Device Behavior Specification"; January 30, 2009.

[5]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[6]   TTA Draft 2011-181-01: Draft of 'Korean Public Alert System over LTE network', 2011 (http://committee.tta.or.kr/include/Download.jsp?filename=choan%2F2011-181_%C3%CA%BE%C8.zip)

Editor's Note : [6] will be updated in SA #56 after release of specification from TTA which is expected to happen by end of September 2011.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [5] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [5].

Commercial Mobile Alert System: Public Warning System that delivers *Warning Notifications* provided by *Warning Notification Providers* to CMAS capable PWS-UEs. CMAS defines three different classes of Warning Notifications (Presidential, Imminent Threat and Child Abduction Emergency)

Earthquake and Tsunami Warning System: Public Warning System that delivers *Warning Notifications* specific to Earthquake and Tsunami provided by *Warning Notification Providers* to the UEs which have the capability of receiving Primary and Secondary *Warning Notifications* within *Notification Areas* through the 3GPP network

Notification Area: area where *Warning Notifications* are broadcast. This is an area that closely approximates the geographical information provided by the Warning Notification Provider

PWS-UE: User Equipment (UE) which has the capability of receiving Warning Notifications within Notification Areas through the 3GPP network and conforms to the behaviour specific to the PWS service such as dedicated alerting indication and display of the Warning Notification upon reception

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [5] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [5]

EOC   Emergency Operations Center

4 General PWS Requirements

4.1 Background

Recently there has been an interest to ensure that the public has the capability to receive timely and accurate alerts, warnings and critical information regarding disasters and other emergencies irrespective of what communications technologies they use. As has been learned from disasters such as earthquakes, tsunamis, hurricanes and wild fires; such a capability is essential to enable the public to take appropriate action to protect their families and themselves from serious injury, or loss of life or property.

This interest to enhance the reliability, resiliency, and security of Warning Notifications to the public by providing a mechanism to distribute Warning Notifications over 3GPP systems is the impetus for this Public Warning System Technical Specification.

4.2 High level general requirements for Warning Notification delivery

The following list gives the high level general requirements for Warning Notification delivery:

- PWS shall be able to broadcast Warning Notifications to multiple users simultaneously with no acknowledgement required.

- PWS shall be able to support concurrent broadcast of multiple Warning Notifications.

- Warning Notifications shall be broadcast to a Notification Area which is based on the geographical information as specified by the Warning Notification Provider.

- PWS capable UEs (PWS-UE) in idle mode shall be capable of receiving broadcasted Warning Notifications.

- PWS shall only be required to broadcast Warning Notifications in languages as prescribed by regulatory requirements.

- Warning Notifications are processed by PWS on a first in, first out basis, subject to regulatory requirements.

- Reception and presentation of Warning Notifications to the user shall not pre-empt an active voice or data session.

- Warning Notifications shall be limited to those emergencies where life or property is at imminent risk, and some responsive action should be taken.

NOTE: This requirement does not prohibit the use of the operator"s network (i.e. broadcast technology) implemented for Warning Notifications to be used for commercial services.

4.3 Warning Notification Content

PWS shall not modify or translate the Warning Notification content specified by the Warning Notification Provider.

It is expected that Warning Notifications would likely include the following five elements:

- Event Description
- Area Affected
- Recommended Action
- Expiration Time (with time zone)
- Sending Agency

Additional elements may be present, based on regulatory requirements.

There is a concern that URLs or telephone numbers in a Warning Notification could exacerbate wireless network congestion at a time when network traffic is already dramatically increasing as individuals contact police, fire, and rescue personnel, as well as their loved ones. Therefore, Warning Notifications should not contain anything that would drive immediate and debilitating traffic loads into the PLMN (i.e., URLs or dialable numbers).

4.4 Granularity of the distribution

Requirements for the granularity of the distribution of Warning Notifications include:

- Based on the geographical information indicated by the Warning Notification Provider, it shall be possible for the PLMN operators to define the Notification Area based on their network configuration of the area coverage such as distribution of cells, Node Bs, RNCs, etc.

4.5 Support of Warning Notification Providers

PLMN operators shall, at a minimum, be able to support the following functionalities through interaction with Warning Notification Providers:

- Activation of Warning Notification delivery

  It shall be possible for multiple Warning Notifications to be activated concurrently from one or more Warning Notification Providers.

- Cancellation of Warning Notification delivery

  A cancellation is a command from the Warning Notification Provider to stop dissemination of a specific Warning Notification.

- Updating of Warning Notification delivery

  Warning Notification Providers update a previous Warning Notification to provide new instructions/information to the PLMN operator. When the Warning Notification Provider updates a previous Warning Notification they provide an identifier that allows the PLMN operator to associate the updated Warning Notification with the previous Warning Notification.

Additional functionality may be required based on regulatory or operator policy requirements.

4.6 PWS-UE Requirements

4.6.1 General Requirements

PWS-UEs shall only be required to receive and present Warning Notifications in languages as presented by the Warning Notification Provider.

There shall be no requirement for language translation in the operator"s network or the UE.

It shall be possible for the Warning Notification to be displayed on the PWS-UE upon reception and without any user interaction.

It shall be possible for users to configure the behavior of a PWS-UE with regard to Warning Notification alerting and should allow at least volume adjustment.

The PWS-UE shall support a dedicated alerting indication (audio attention signal and a dedicated vibration cadence) and be distinct from any other device alerts and restricted to use for Warning Notification purposes. The User Interface shall support the ability for the user to suppress the dedicated audio attention signal and/or the dedicated vibration cadence when a Warning Notification is received.

The alerting indication for a specific Warning Notification shall continue until suppressed by users' manual operation (e.g. by pushing keys). The frequency and duration of the continued alerting indication is mobile device implementation specific. This shall not suppress the alerting indication for subsequent Warning Notifications.

The PWS-UE shall automatically suppress duplicate notifications. A duplicate is a repetition of a previous notification as determined by unique parameters.

The PWS-UE shall not support any capabilities to forward received Warning Notifications, to reply to received Warning Notifications, or to copy and paste the content of Warning Notifications.

PWS-UEs should have the ability to present previously displayed Warning Notifications if requested by the user.

- PWS-UE shall be able to support concurrent reception of multiple Warning Notifications.

4.6.2 Support of non-Warning Notification capable UEs

Support of non-Warning Notification capable UEs is subject to regulatory requirements and/or operator's policy.

4.6.3 Battery Life of PWS-UE

Battery life of the PWS-UE shall not be significantly reduced by PWS.

4.6.4 Enabling and disabling of Warning Notifications

The PWS-UE shall be configured to receive all Warning Notifications.

It shall be possible for users to disable (e.g., opt-out) presentation of some or all of the Warning Notifications, subject to regulatory requirements and/or operator policy. The user shall be able to select PWS-UE enabling/disabling options via the User Interface to disable, or later enable, the PWS-UE behavior in response to some or all Warning Notifications.

4.7 Roaming Requirements

It shall be possible for PWS-UEs that are enabled for Warning Notifications in the HPLMN to receive Warning Notifications from the VPLMN supporting PWS when roaming.

A PWS-UE that does not support the PWS requirements of the VPLMN"s PWS service may not receive Warning Notifications from that VPLMN.

NOTE: See section 4.9 for roaming impacts to PWS due to regional regulatory requirements.

4.8 Security Requirements

Security requirements are as follows:

PWS shall only broadcast Warning Notifications that come from an authenticated authorized source.

The integrity of the Warning Notification shall be protected.

The PWS will protect against false Warning Notification messages.

The authentication of the Warning Notification Providers is outside the scope of 3GPP Specifications.

NOTE: These requirements are subject to regulatory policies.

4.9 Regulatory Requirements

The PWS offered by a PLMN may be subject to PWS regional regulatory requirements and thus, the PWS offered may differ from PLMN to PLMN as well as from region to region within a PLMN.

5 Earthquake and Tsunami Warning System

5.1 Background

Warning Notifications are expected to be delivered to the users while satisfying the following requirements:

- Quick Warning Notification delivery after the occurrence of Earthquake or Tsunami.

   Earthquake and Tsunami propagate very fast. The duration time between the actual occurrence of the disaster and its arrival is very short. The order of the duration time is around seconds or minutes at most. Therefore the Warning Notifications shall be delivered quickly to the users in the emergency impacted area so that they could take any actions to escape from danger.

- Accurate Warning Notification delivery.

   Warning Notification delivery urges the users to take the actions such as evacuation. Therefore, the Warning Notification shall be delivered to the users accurately in the Notification Area and the content of Warning Notification should be understandable for many types of users (i.e. impaired persons, foreigners).

5.2 Duration of delivery time

Duration of the delivery time for PLMN operators is the time from the receipt of the Warning Notification by the PLMN operator, i.e. the edge of the 3GPP network, to the time that the Warning Notification is successfully delivered to the UEs.

Provisioning of delivery of Primary and Secondary Notification may be required:

- Primary Notification shall be delivered within 4 seconds to the UE in the Notification Area even under congestion situation.

- Secondary Notification is delivered to the users in the Notification Area even under congestion situation.

NOTE 1: UEs that are out of coverage or switched off are not considered in the requirements.

NOTE 2: Secondary Notification may not always be generated as it depends on the Warning Notification Provider"s policy.

NOTE 3: Primary Notification may not always be generated (i.e. the warning may start with a Secondary Notification).

5.3 Information element and volume

The following are the requirements from the perspective of information element and amount of data.

Both Primary and Secondary Notification shall:

- support at least 2 types of emergency events, which are Earthquake and Tsunami;

- be able to indicate the preferred UE behaviours when receiving Warning Notification, (e.g. whether to display text in the foreground, whether to ring a buzzer, whether to vibrate);

- be distinguishable from notifications generated for the purpose of testing, training and other notification services;

- be sent in an optimized type and amount of data, for example, a text with a certain length, by considering the delivery platforms for ETWS.

Primary Notification shall:

- convey data which is small enough to be sent quickly on the network.

- convey small amount of data to indicate the imminent occurrence of Earthquake and Tsunami, etc.

Secondary Notification may:

- convey a large amount of data in order to deliver text, audio to instruct what to do / where to get help, graphical data such as a map indicating the route from present position to evacuation site, time table of food distribution.

- NOTE: The amount of data to be sent within a Primary Notification would be a few bytes to achieve quick information delivery.

5.4 Priority

Requirements from the perspective of priority are as follows:

- Primary Notification has higher priority than Secondary Notification.

- Notifications shall be able to be sequenced by the PLMN according to priority of notification in case that Primary Notification and Secondary Notification should exist at the same time in PLMN.

5.5 Roaming users

Upon receiving Primary Notification which includes small amount of data to indicate the imminent occurrence of an Earthquake and/or Tsunami, the UE shall display the Warning Notification in a way that is easy to understand by the user, such as an icon or picture.

- NOTE: It is expected that that the Warning Notification Provider will send the Warning Notification in the languages in common use in the specific area or in such a way that the Warning Notification can reasonably be understood.

6   CMAS Specific Requirements

6.1   Introduction to CMAS

The Warning Alert and Response Network (WARN) Act[1] was passed by Congress in September 2006 and was signed into law on October 13, 2006.

The Federal Communication Commission (FCC) released the three Report and Order rulings for the Commercial Mobile Alert System. [1], [2], [3] and [4].

As a result of these legislative and regulatory actions the Alliance for Telecommunication Solutions (ATIS) and the Telecommunications Industry Association (TIA) agreed to develop ATIS and TIA standards to support the deployment of CMAS. This standard is listed in Clause 2.

The scope of these specifications includes the support of Commercial Mobile Alert System (CMAS) alert message via the GSM/UMTS Cell Broadcast functionality. These specifications covers the mapping of CMAS messages onto the 3GPP-defined Cell Broadcast functionality, as well as the CMAS application layer functionality from the reception of the CMAS alert message from the Warning Notification Provider to the point of reception by the CMAS capable mobile device.

The CMAS functionality does not require modifications to the 3GPP-defined cell broadcast functionality.

The following functional reference model is based on the diagram from Section III.B.10 of the FCC First Report and Order for the Commercial Mobile Alert System, FCC 08-99 [1]:
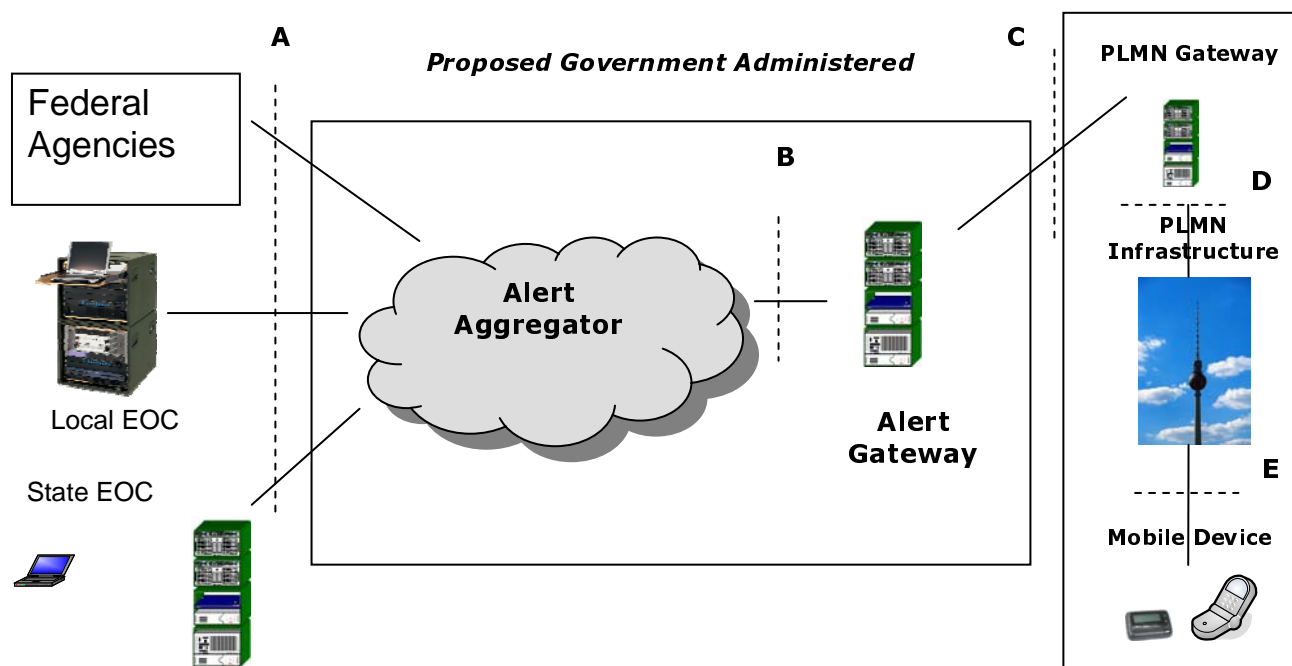

Figure 1: CMAS Reference Architecture

6.2   Additional PWS Requirements Specific to CMAS

In addition to the General Requirements specified in Clause 4, the following requirements are specified for the deployment of CMAS. These CMAS specific requirements are further specified in [4].

Three classes of Warning Notifications shall be supported; Presidential, Imminent Threat, and Child Abduction Emergency (e.g. AMBER).

A CMAS-capable User Interface (UI) shall support the ability for the user to opt-out of only the Imminent Threat and Child Abduction Emergency Warning Notifications. When a Presidential Warning Notification is received, it is always presented to the user whenever Cell Broadcast Service is enabled on the UE.

The current implementation requirement is for messages of up to 90 characters English text supported by GSM 7-bit encoding.

7 Korean Public Alert System specific Requirements

7.1 Introduction to Korean Public Alert System

TTA has specified a Korean Public Alert system which is based on PWS in [x]. That specification includes the support of Korean Public Alert System messages via the LTE Warning Message Delivery functionality. The Korean Public Alert System specification [6] also specifies application layer functionality to handle the transmission of CBS data from CBE to CBC and support for transmission of the same public alert message to UEs belonging to different mobile network operators in Republic of Korea. That specification requires that the system supporting Korean Public Alert System shall transmit the public alert message with high priority in order to provide up-to-date information on emergency situations. (e.g. In Tsunami situation, it is recommended to deliver message between CBC and UE in several seconds.).

7.2 Additional PWS Requirements Specific to Korean Public Alert System

In addition to the General Requirements specified in Clause 4, the following requirements are specified for the Korean Public Alert System [6]:

- Only one class of Warning Notification is required for the Korean Public Alert System. The characteristics of the Warning Notification shall follow the requirements specified in clause 4.

The current implementation requirement is for the message of up to 180Bytes (90 Korean Characters) text.

Annex A (informative): Change history

<table>
<tr><th colspan="12">Change history</th></tr>
<tr><th>TSG SA#</th><th>SA Doc.</th><th>SA1 Doc</th><th>Spec</th><th>CR</th><th>Rev</th><th>Rel</th><th>Cat</th><th>Subject/Comment</th><th>Old</th><th>New</th><th>WI</th></tr>
<tr><td>SP-42</td><td>SP-080788</td><td>S1-084395</td><td>22.268</td><td>-</td><td>-</td><td>Rel-9</td><td>-</td><td>One-step-approved by SA#42</td><td>1.0.1</td><td>9.0.0</td><td>PWS</td></tr>
<tr><td>SP-43</td><td>SP-090085</td><td>S1-090201</td><td>22.268</td><td>0001</td><td>1</td><td>Rel-9</td><td>D</td><td>Fix for a note that is floating out of context</td><td>9.0.0</td><td>9.1.0</td><td>PWS-S1</td></tr>
<tr><td>SP-43</td><td>SP-090085</td><td>S1-090202</td><td>22.268</td><td>0002</td><td>1</td><td>Rel-9</td><td>F</td><td>Proposal to solve conflicting requirements</td><td>9.0.0</td><td>9.1.0</td><td>PWS-S1</td></tr>
<tr><td>SP-43</td><td>SP-090085</td><td>S1-090203</td><td>22.268</td><td>0004</td><td>1</td><td>Rel-9</td><td>F</td><td>Regulatory Requirements Pertaining to Roaming</td><td>9.0.0</td><td>9.1.0</td><td>PWS-S1</td></tr>
<tr><td>SP-43</td><td>SP-090085</td><td>S1-090204</td><td>22.268</td><td>0005</td><td>-</td><td>Rel-9</td><td>F</td><td>Removal of "subject to regulatory requirements" from PWS-UE requirements</td><td>9.0.0</td><td>9.1.0</td><td>PWS-S1</td></tr>
<tr><td>SP-43</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ETSI clean-up: apply correct style and layout</td><td>9.0.0</td><td>9.1.0</td><td>-</td></tr>
<tr><td>SP-44</td><td>SP-090375</td><td>S1-091398</td><td>22.268</td><td>0006</td><td>1</td><td>Rel-9</td><td>F</td><td>Update Reference [4]</td><td>9.1.0</td><td>9.2.0</td><td>PWS</td></tr>
<tr><td>SP-44</td><td>SP-090375</td><td>S1-091397</td><td>22.268</td><td>0007</td><td>1</td><td>Rel-9</td><td>F</td><td>CR 22.268 Clarify Requirements for Handling of Concurrent PWS Warning Notifications</td><td>9.1.0</td><td>9.2.0</td><td>PWS</td></tr>
<tr><td>SP-44</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Re-introduction of the figure in 6.1 which disappeared for some obscure reason</td><td>9.2.0</td><td>9.2.1</td><td>-</td></tr>
<tr><td>2011-03</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Update to Rel-10 version (MCC)</td><td>9.2.1</td><td>10.0.0</td><td></td></tr>
<tr><td>SP-53</td><td>SP-110574</td><td>S1-112404</td><td>22.268</td><td>0016</td><td>4</td><td>Rel-10</td><td>B</td><td>Korean Public Alert System specific requirements</td><td>10.0.0</td><td>10.1.0</td><td>TEI10</td></tr>
</table>

History

Document history		
V10.0.0	May 2011	Publication
V10.1.0	October 2011	Publication