Technical Specification Group Services and System Aspects Meeting #25, Palm Springs, USA

TSGS#25(04)0512

Source: **SA1**

Title: **Various CRs to 42.068 on VGCS (Rel-7)**

Document for: **Approval**

Agenda Item: **7.1.3**

Meeting	SA Doc	TS No.	CR No	Rev	Rel	Cat	Subject	Vers. Current	Vers New	SA1 Doc
SP-25	SP-040512	42.068	003	-	Rel-7	B	VGCS support of service provider specific end-to-end encryption	5.0.1	7.0.0	S1-040707
SP-25	SP-040512	42.068	004	1	Rel-7	B	Sending of SMS to an ongoing Voice Group Call	5.0.1	7.0.0	S1-040725
SP-25	SP-040512	42.068	005	-	Rel-7	B	Enhanced talker functionality for VGCS for the support of emergency situations	5.0.1	7.0.0	S1-040728

CR-Form-v7

CHANGE REQUEST

⌘ **42.068** **CR** **003** ⌘ **rev** **-** ⌘ Current version: **5.0.1** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☒

Title:	⌘	VGCS support of service provider specific end-to-end encryption
Source:	⌘	SA1 (Siemens, T-Mobile, Vodafone)
Work item code:	⌘	EGCS
Date:	⌘	28/06/2004
Category:	⌘	**B**
Release:	⌘	Rel-7

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	It is envisaged, that VGCS can in future be used in public networks for communication of public authority officials (police, firebrigade ..) For security reasons it is required to support end to end encryption. The encryption method is specific to the service provider and is not specified. However, to broadcast encrypted speech within a VGCS call it is required that the network does not perform any codec checks or add anything. The requirement is independent of and in addition to the requirement of VGCS to support radio ciphering
Summary of change:	⌘	The requirement on the support of encrypted speech is added.
Consequences if not approved:	⌘	Requirements, mandated by public authorities to be able to use VGCS in public networks for e.g. firebrigades and police, could not be met.

Clauses affected:	⌘	2, new clause 5.3.1			
Other specs affected:	⌘	**Y**	**N**		
		X		Other core specifications	⌘ 43.068, 44.018, 48.008, 29.002, 31.102
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	This will result in the creation of a release 6 version of this specification.			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** first modified section**********

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] 3G TR 41.004: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; Abbreviations and acronyms".

[2] 3G TS 22.067: "3rd Generation Partnership Project; Technical Specification Group Services and system Aspects; enhanced Multi-Level Precedence and Pre-emption service (eMLPP) – Stage 1".

[3] 3G TS 32.005: "3rd Generation Partnership Project; Technical Specification Group Services and system Aspects; Telecommunications Management; Charging and billing; GSM call and event data for the Circuit Switched (CS) domain".

[4] 3G TS 43.020 "3rd Generation Partnership Project;Technical Specification Group Services and system Aspects; Security related network functions"

********** last modified section**********

5.3 Network related service configuration

The network related service configuration defines the attributes of a particular voice group call which shall be pre-registered in the network by the service provider. This is not related to one specific service subscriber.

The attributes of a particular voice group call are group ID, group call area composition, a list of dispatcher identities to be connected to this area, a list of dispatchers allowed to initiate voice group calls to this area, the group call reference which shall be used in case of COLP (see subclause 7.3) and dispatcher identities to which an optional acknowledgement can be routed. Changes to the group call area composition shall be co-ordinated with the network operator.

5.3.1 Speech encryption for voice group calls

Optionally, a service provider shall be able to configure a voice group call in such a way, that the network does not perform codec checks. By this means the service provider shall be enabled to provide proprietary mechanisms to allow end-to-end encryption of speech between service subscribers.

Note: This requirement is independent of and in addition to the requirement of VGCS to support radio ciphering (TS 43.020 [4])

CR-Form-v7

CHANGE REQUEST

⌘ **42.068** **CR** **004** ⌘ **rev** **1** ⌘ Current version: **5.0.1** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [X]

Title:	⌘	Sending of SMS to an ongoing Voice Group Call
Source:	⌘	SA1 (Siemens, T-Mobile, Vodafone)
Work item code:	⌘	EGCS
Date:	⌘	28/06/2004
Category:	⌘	**B**
Release:	⌘	Rel-7

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	It should be possible to send a short message to a voice group call. The short message shall only be delivered if the group call is established
Summary of change:	⌘	The requirement for sending a SMS to an established group call is added.
Consequences if not approved:	⌘	Requirements, mandated by public authorities to be able to use VGCS in public networks for e.g. firebrigades and police, could not be met.
Clauses affected:	⌘	4, 7.21

	Y	N			
Other specs affected: ⌘	X		Other core specifications	⌘	43.068, 44.018, 48.008, 29.002
		X	Test specifications		
		X	O&M Specifications		

Other comments:	⌘	This will result in the creation of the Release 6 version of this TS

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********** first modified section**********

4 Description

The VGCS is defined in the following. Figure 1 gives an explanation of the logical concept of the VGCS.

a) The VGCS enables a calling subscriber to establish a voice group call to destination subscribers belonging to a predefined group call area and group ID.

NOTE 1: The service is provided by use of half duplex transmission mode.

Applications for voice group call services typically involve multiple group members in a small group call area, for which the VGCS should provide spectrum efficient solutions.

b) The calling subscriber as well as the destination subscribers may be any service subscriber which has subscribed to the related group ID or any dispatcher who is entitled to it by his identity which shall be registered in the network.

c) Destination subscribers are all service subscribers or a group of service subscribers identified by the called group ID which have their present location in the group call area, and pre-registered dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the subscriber individually. Dispatchers shall be called individually with their identity.

Service subscribers may become late destination subscribers when entering the group call area within 500 ms after reception of the first notification message related to the VGCS call. Service subscribers which leave the corresponding group call area during an on going VGCS call of which they are member cease to be destination subscribers.

d) The voice group call shall be established in a group call area which is comprised of one or a cluster of cells. Group call areas shall be predefined in the network by the service provider, co-ordinated by the network operator.

In case of a service subscriber initiating a VGCS, the group call area is uniquely identified by the actual cell in which the service subscriber resides at the moment of VGCS call initialization and by the group ID they issue.

A dispatcher initiating a VGCS call will be connected to a related predefined group call area. The entitlement of the dispatcher is checked by the network element responsible for the voice group call management by verification of the calling identity. Since a dispatcher may be registered to more than one group call area and group ID an indication of the wanted group call area and group ID has to be given in form of a dedicated address called by the dispatcher.

e) The service shall permit only one talking service subscriber at any moment; additionally up to five dispatcher can be talking simultaneously at one time. Dispatchers should hear all combinations of voices other than their own. Listening service subscribers shall hear the combination of all voices. The talking service subscriber shall gain some audible indication if any dispatchers are talking simultaneously.

Dispatchers shall be able to talk at any moment without any need to signal the wish to talk. Service subscribers who wish to talk shall indicate this. They shall only be able to become talking subscribers if there is no other talking service subscriber. The right to be a talking service subscriber is allocated on a first come first served basis without queuing. Once a service subscriber has become a talking subscriber they shall eventually indicate their wish to become a listening subscriber, or the network may detect that they are no longer a talking subscriber due to time-out or other mechanisms.

~~SMS,~~ CW and procedures for supplementary service management are not possible for a service subscriber.

f) The calling subscriber shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that he can start to speak.

NOTE 2: A successful establishment means that all voice group call downlink channels are allocated, with the restrictions mentioned in clause 6, whether somebody is listening or not, and the related dispatchers are alerted.

The system provides that for an established voice group call the uplink assignment to a service subscriber who

wishes to talk is performed under normal conditions in <300 ms after a request to talk is made.

The mobile station of the talking service subscriber shall be requested to send its IMSI to the network in order so that the talker's IMSI be stored in the event records.

g) Authentication is mandatory at GSM call set up. To allow fast call set up in VGCS authentification of calling subscribers at invocation may optionally be delayed. Similarly authentication of the talking service subscriber may optionally be delayed to allow fast access.

Confidentiality on the radio path is optional.

h) Different levels of priority and pre-emption shall be applied as defined in the stage 1 description on the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) in 3G TS 22.067.

i) A number of voice group calls may exist simultaneously intended for different groups of destination users in the same group call area.

Parallel voice group calls are possible to the same group of destination subscribers in different, possibly overlapping, group call areas.

j) A voice group call shall be released on demand of the calling subscriber or by a dispatcher or by the network.

NOTE 3: The release by the calling subscriber is only possible if the uplink is assigned to the calling subscriber.

Automatic release of a voice group call after a selectable time of no voice activity is required.

j1) If the mobile station having the uplink assigned leaves the group call area, it shall also leave the voice group call. However, the voice group call shall be maintained by the network.

This behaviour shall also apply if the mobile station is the calling subscriber.

k) VGCS shall also be provided in case of roaming. For this, certain group Ids shall be defined as supra-PLMN group Ids which have to be co-ordinated between the network operators and which shall be known in the networks and in the SIM. A service subscriber which is entitled by his subscription to establish voice group calls while roaming shall only be able to use supra-PLMN group Ids in case of roaming.

l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed at the end of the voice group call. The acknowledgement shall indicate the time the reception started and the time the reception terminated. The acknowledgement has to be given to a predefined recipient.

m) It shall be possible for a service subscriber to activate or deactivate the voice group call reception for different group Ids. The selection list is stored on the SIM corresponding to the subscribed group Ids. It shall be possible to prohibit the deactivation of group Ids used for high priority calls.

Dispatcher which are registered for a certain voice group call and which have also a subscription for VGCS with the same group ID as the voice group call for which they are dispatcher shall deactivate this group ID when they are located in the corresponding group call area in order to avoid conflicts between paging for the dispatcher and notifications for the group ID.

- The calling subscriber may specify, at call setup, information to be presented at call setup to the dispatchers. This information is sent as originator-to-dispatcher information to the network, and sent as UUS1 by the network to the dispatchers in the message for call setup. For normal call setup, the information is subject to the same constraints as UUS1 information in the setup of a point-to-point call. For fast setup, the information is restricted to 12 digits (with leading zeros); inclusion of originator-to-dispatcher information at fast setup is only possible if the mobile station has a valid TMSI. It is a network option to support originator-to-dispatcher information, or to ignore it. The inclusion of originator-to-dispatcher information in the VGCS call setup is not subject to provision or withdrawal.

n) An advisor shall be able to become talker with a higher priority than a service subscriber; if a different service subscriber is the current talker then this talker shall be released from being a talker. An advisor who is talking can only be preempted by an indication of a case of emergency.

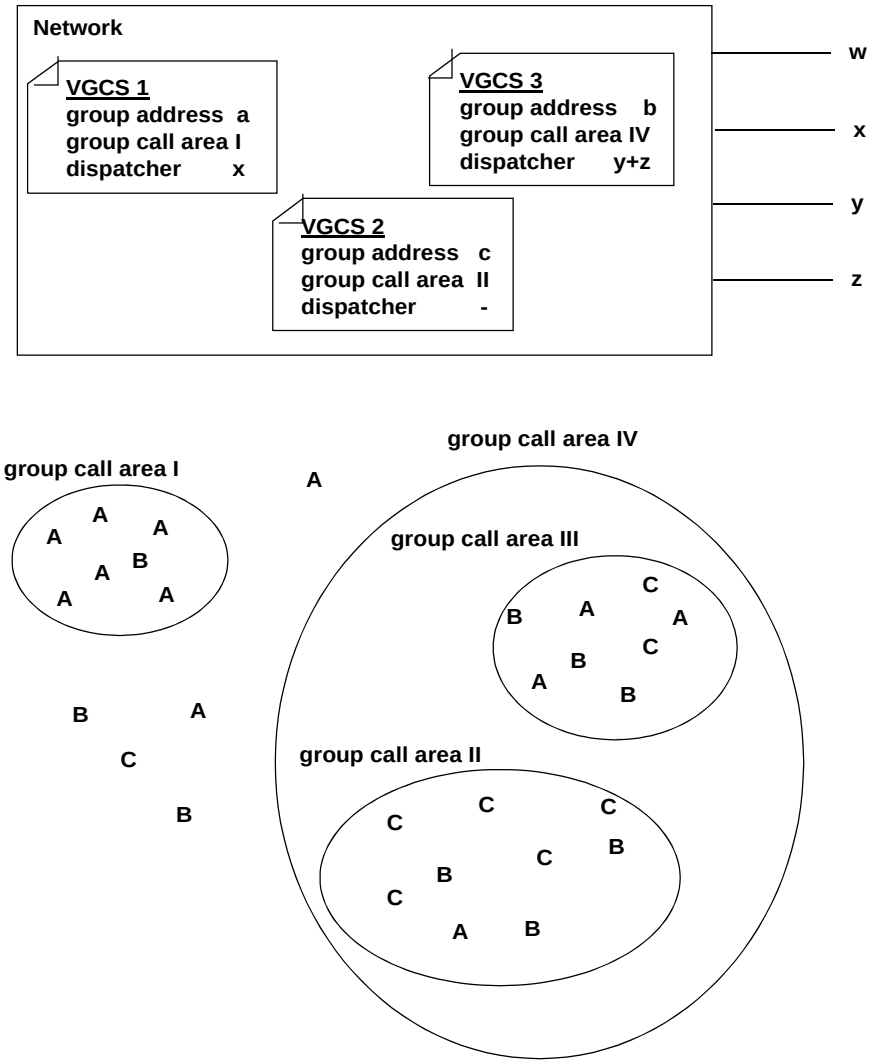
o) It shall be possible for a service subscriber to indicate a case of emergency to the network. When a service subscriber is indicating a case of emergency to the network he shall become talker of the emergency group call;

if a different service subscriber or an advisor is the current talker then this talker shall be released from being a talker.
- if more than one subscriber indicates a case of emergency to the network the first shall get the talker function
- the indication of a case of emergency shall periodically be signalled to all subscribers of the voice group call, irrespective of whether they have activated or deactivated the voice group call reception.
- only an advisor shall be able to terminate the periodic signalling of a case of emergency in the voice group call.

Note: The above requirement applies only to voice group calls to which at least one advisor has subscribed.

p) As a subscription option for service subscribers it shall be possible to display additional information about the current talker to all listeners of the voice group call. The additional information shall consist of short text strings. The additional information shall be sent to all listeners when the service subscriber becomes a talker. In order for late entrants to receive this information, the additional information should be transmitted periodically to all active cells of the ongoing voice group call until the talker gives up his talker functionality.

Note: This additional information could e.g. contain information about the talker's function within the group such as "driver of fire engine XY".



NOTE: VGCS1, VGCS2, VGCS3 = particular voice group calls with the attributes pre-registered in the network.
A, B, C, D = service subscriber with group ID a, b, c or d, respectively.
II, III, IV = group call areas.
w, x, y, z = dispatchers connected via normal GSM links or external networks.

Figure 1: Logical concept of the VGCS

********** last modified section**********

7.21 Short Message Service (SMS)

Subject to capabilities of the UE it shall be possible for the talker in a voice group call as well as for other initiators of short messages that are not part of the voice group call to send short messages to the established voice group call.

Note 1: It is not required that listeners in a voice group call are able to send short messages.

A receipt confirmation, containing the group call reference of the voice group, may be returned to the sender of the short message. However no receipt confirmation shall be returned by individual members of the voice group.

Service subscribers who have activated the voice group call reception shall be able to receive the content of short messages sent to the group call. The terminal shall treat the received content in the same way as if it would have been received by the normal SMS mechanism.

Note 2: It is not required that dispatchers are able to receive the content of the SMS sent to the group.

Support of Short Message Service is optional in VGCS.

~~Sending or reception of short messages is not possible for service subscribers involved in a voice group call.~~

CR-Form-v7

CHANGE REQUEST

⌘ **42.068** **CR** **005** ⌘ **rev** **-** ⌘ Current version: **5.0.1** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☒

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Source:	⌘	SA1 (Siemens, T-Mobile, Vodafone)
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Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	For the usage of VGCS in public networks it is required that a subcriber can request talker functionality in case of an emergency. For emergency cases within public networks certain service subscribers need to have privileges related to talker requests. Some applications in public networks require that information related to the current talker needs to be transmitted and displayed to all listeners of the VGCS
Summary of change:	⌘	The following requirements are added: - A requirement for optional service subscriber privileges - Indication of emergency situations and talker change in case of emergency; - Transmission of talker related information;
Consequences if not approved:	⌘	Requirements, mandated by public authorities to be able to use VGCS in public networks for e.g. firebrigades and police, could not be met.

Clauses affected:	⌘	4			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	43.068, 44.018, 48.008, 29.002
		N / **X**	Test specifications		
		N / **X**	O&M Specifications		
Other comments:	⌘	This CR will generate also the Release 6 version of the current specification			

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4 Description

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a) The VGCS enables a calling subscriber to establish a voice group call to destination subscribers belonging to a predefined group call area and group ID.

NOTE 1: The service is provided by use of half duplex transmission mode.

Applications for voice group call services typically involve multiple group members in a small group call area, for which the VGCS should provide spectrum efficient solutions.

b) The calling subscriber as well as the destination subscribers may be any service subscriber which has subscribed to the related group ID or any dispatcher who is entitled to it by his identity which shall be registered in the network.

c) Destination subscribers are all service subscribers or a group of service subscribers identified by the called group ID which have their present location in the group call area, and pre-registered dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the subscriber individually. Dispatchers shall be called individually with their identity.

Service subscribers may become late destination subscribers when entering the group call area within 500 ms after reception of the first notification message related to the VGCS call. Service subscribers which leave the corresponding group call area during an on going VGCS call of which they are member cease to be destination subscribers.

d) The voice group call shall be established in a group call area which is comprised of one or a cluster of cells. Group call areas shall be predefined in the network by the service provider, co-ordinated by the network operator.

In case of a service subscriber initiating a VGCS, the group call area is uniquely identified by the actual cell in which the service subscriber resides at the moment of VGCS call initialization and by the group ID they issue.

A dispatcher initiating a VGCS call will be connected to a related predefined group call area. The entitlement of the dispatcher is checked by the network element responsible for the voice group call management by verification of the calling identity. Since a dispatcher may be registered to more than one group call area and group ID an indication of the wanted group call area and group ID has to be given in form of a dedicated address called by the dispatcher.

e) The service shall permit only one talking service subscriber at any moment; additionally up to five dispatcher can be talking simultaneously at one time. Dispatchers should hear all combinations of voices other than their own. Listening service subscribers shall hear the combination of all voices. The talking service subscriber shall gain some audible indication if any dispatchers are talking simultaneously.

Dispatchers shall be able to talk at any moment without any need to signal the wish to talk. Service subscribers who wish to talk shall indicate this. They shall only be able to become talking subscribers if there is no other talking service subscriber. The right to be a talking service subscriber is allocated on a first come first served basis without queuing. Once a service subscriber has become a talking subscriber they shall eventually indicate their wish to become a listening subscriber, or the network may detect that they are no longer a talking subscriber due to time-out or other mechanisms.

SMS, CW and procedures for supplementary service management are not possible for a service subscriber.

f) The calling subscriber shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that he can start to speak.

NOTE 2: A successful establishment means that all voice group call downlink channels are allocated, with the restrictions mentioned in clause 6, whether somebody is listening or not, and the related dispatchers are alerted.

The system provides that for an established voice group call the uplink assignment to a service subscriber who

wishes to talk is performed under normal conditions in <300 ms after a request to talk is made.

The mobile station of the talking service subscriber shall be requested to send its IMSI to the network in order so that the talker's IMSI be stored in the event records.

g) Authentication is mandatory at GSM call set up. To allow fast call set up in VGCS authentification of calling subscribers at invocation may optionally be delayed. Similarly authentication of the talking service subscriber may optionally be delayed to allow fast access.

Confidentiality on the radio path is optional.

h) Different levels of priority and pre-emption shall be applied as defined in the stage 1 description on the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) in 3G TS 22.067.

i) A number of voice group calls may exist simultaneously intended for different groups of destination users in the same group call area.

Parallel voice group calls are possible to the same group of destination subscribers in different, possibly overlapping, group call areas.

j) A voice group call shall be released on demand of the calling subscriber or by a dispatcher or by the network.

NOTE 3: The release by the calling subscriber is only possible if the uplink is assigned to the calling subscriber.

Automatic release of a voice group call after a selectable time of no voice activity is required.

j1) If the mobile station having the uplink assigned leaves the group call area, it shall also leave the voice group call. However, the voice group call shall be maintained by the network.

This behaviour shall also apply if the mobile station is the calling subscriber.

k) VGCS shall also be provided in case of roaming. For this, certain group Ids shall be defined as supra-PLMN group Ids which have to be co-ordinated between the network operators and which shall be known in the networks and in the SIM. A service subscriber which is entitled by his subscription to establish voice group calls while roaming shall only be able to use supra-PLMN group Ids in case of roaming.

l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed at the end of the voice group call. The acknowledgement shall indicate the time the reception started and the time the reception terminated. The acknowledgement has to be given to a predefined recipient.

m) It shall be possible for a service subscriber to activate or deactivate the voice group call reception for different group Ids. The selection list is stored on the SIM corresponding to the subscribed group Ids. It shall be possible to prohibit the deactivation of group Ids used for high priority calls.

Dispatcher which are registered for a certain voice group call and which have also a subscription for VGCS with the same group ID as the voice group call for which they are dispatcher shall deactivate this group ID when they are located in the corresponding group call area in order to avoid conflicts between paging for the dispatcher and notifications for the group ID.

- The calling subscriber may specify, at call setup, information to be presented at call setup to the dispatchers. This information is sent as originator-to-dispatcher information to the network, and sent as UUS1 by the network to the dispatchers in the message for call setup. For normal call setup, the information is subject to the same constraints as UUS1 information in the setup of a point-to-point call. For fast setup, the information is restricted to 12 digits (with leading zeros); inclusion of originator-to-dispatcher information at fast setup is only possible if the mobile station has a valid TMSI. It is a network option to support originator-to-dispatcher information, or to ignore it. The inclusion of originator-to-dispatcher information in the VGCS call setup is not subject to provision or withdrawal.

n) Optionally, a service subscriber may be given a subscription option to receive privilege for the following:

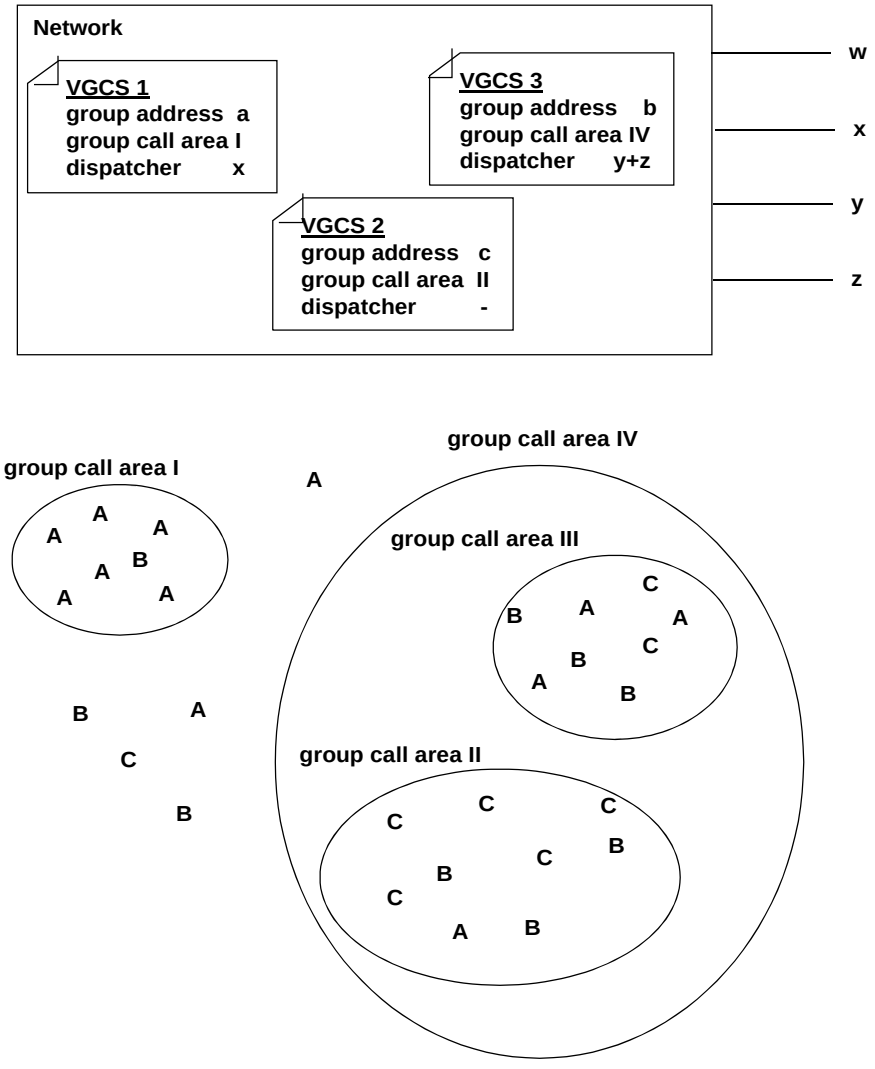
- A privileged service subscriber shall be able to release the current talker (i.e. the current talker shall become a listener, but not released from the call) and become the talker.

o) Optionally, a service subscriber shall be able to indicate an emergency situation to the network, and become the

talker even if the current talker is a privileged talker. Until this service subscriber has stopped being the talker he shall not be released by another service subscriber unless the periodic emergency signalling has been terminated by a privileged service subscriber.

- If more than one subscriber indicates an emergency situation to the network the first one becomes the talker.
- It shall be possible to periodically transmit an emergency indication to all service subscribers of the VGCS even the ones that have deactivated the voice group call reception. This should continue until the voice group call is released or the periodic emergency transmission is terminated by a privileged service subscriber

p) Optionally, it shall be possible to display additional information (short text stings e.g., "fire arm expert") about the current talker to all the listeners of the voice group call. The additional information shall be sent to all listeners when the service subscriber becomes a talker and should be transmitted periodically to all active cells of the ongoing voice group call until a different service subscriber becomes the current talker or the group call is released.



NOTE: VGCS1, VGCS2, VGCS3 = particular voice group calls with the attributes pre-registered in the network.
A, B, C, D = service subscriber with group ID a, b, c or d, respectively.
II, III, IV = group call areas.
w, x, y, z = dispatchers connected via normal GSM links or external networks.

Figure 1: Logical concept of the VGCS