TSGS#27(05) 0209

Source: **SA1**

Title: **CRs to 02.68 and 42.068 on Correction on the use of calling subscriber and destination subscriber (R99, Rel-4 Rel-5, Rel-6, 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-28	SP-050209	02.68	A015	-	R99	F	Correction on the use of calling subscriber and destination subscriber (02.68 - R99)	8.1.0	8.2.0	S1-050469
SP-28	SP-050209	42.068	009	-	Rel-4	A	Correction on the use of calling subscriber and destination subscriber (42.068 - Rel-4)	4.1.0	4.2.0	S1-050470
SP-28	SP-050209	42.068	010	-	Rel-5	A	Correction on the use of calling subscriber and destination subscriber (42.068 - Rel-5)	5.0.1	5.1.0	S1-050471
SP-28	SP-050209	42.068	011	-	Rel-6	A	Correction on the use of calling subscriber and destination subscriber (42.068 - Rel-6)	6.0.0	6.1.0	S1-050472
SP-28	SP-050209	42.068	012	-	Rel-7	A	Correction on the use of calling subscriber and destination subscriber (42.068 - Rel-7)	7.2.0	7.3.0	S1-050477

TSG-SA WG1 #28 **S1-050469**
Beijing, China, 4th to 8th April 2005 **Agenda Item: 8**

CR-Form-v7

CHANGE REQUEST

⌘ **02.68** **CR** **A015** ⌘ **rev** **-** ⌘ Current version: **8.1.0** ⌘

*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:	⌘	Correction on the use of calling subscriber and destination subscriber
Source:	⌘	SA1 (Nortel Networks, Siemens)
Work item code:	⌘	ASCI
Date:	⌘	07/04/2005
Category:	⌘	**F**
Release:	⌘	R99

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)
Rel-7 (Release 7)

Reason for change:	⌘	According to the definition in 3.1 in 02.68, a calling subscriber can be a service subscriber or a dispacher. However, the behaviour of each of these and their handling in the network is different. The stage 1does not reflect the functionality that is currently in the nework. Currently, there are two different implementations in the field due to this 2G (GSM) specification being unclear, which has to be corrected. The ambiguities the use of 'calling subscriber' creates in the specification need to be corrected. Likewise a destination subscriber can be a service subscriber or a dispatcher and the specification needs to be corrected in a similar way.
Summary of change:	⌘	Added definition for 'calling service subscriber', 'calling dispatcher', 'destination service subscriber', 'destination dispatcher' and 'destination subscriber(s)'. Deletion of definition of 'calling subscriber' and definition of 'destination subscriber'. Made corrections thoughout the specification using the new definitions. Also, a Note is added in Section 4 (e) to explain that the indication which the talking subscriber recieves when a dispatcher is also talking may be the dispatcher's voice.
Consequences if not approved:	⌘	Incorrect and misleading specification will cause problem in interoperability.

Clauses affected:	⌘	3.1, 4, 5.4, 6 & 7

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

Other comments: ⌘

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

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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 Changed Section* ******

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

~~network~~ Network operator: Entity which provides the network operating elements and resources for the execution of the VGCS.

Service provider: Entity which offers the VGCS for subscription. The network operator may be the service provider.

Voice group call: An instance of the VGCS initiated by a subscriber. This term is used synonymously with the term "VGCS call".

Service subscriber: Mobile subscriber which subscribes to the VGCS.

Group identification (group ID): A numerical classification. The maximum number of group Ids which can be defined in one PLMN depends on the maximum number of group call areas defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, Service subscriber shall be provided with one or up to 50 group Ids.

Dispatcher: Particular fixed line or mobile users are identified within the network as dispatchers. Dispatchers shall receive all voice group calls to a certain group ID in a group call area (this shall be done automatically by the network). In addition they can initiate voice group calls to a group ID in a group call area.

Dispatchers shall be connected to a voice group call by means of standard links via radio or via an ISDN. They shall be called by their MSISDN or ~~MS~~ISDN number, respectively. When dispatchers initiate voice group calls, they shall call a particular MSISDN number which is related to a group ID and group call area. Dispatchers using the GSM network can be located outside of this group call area.

The identities of the dispatchers are exclusively predefined in the network by the service provider. There will be none or up to five dispatchers involved in a particular voice group call.

Destination service subscriber: Service subscriber ~~or dispatcher~~ to which the VGCS call is directed.

Calling service subscriber: Service subscriber ~~or dispatcher~~ which originates the VGCS call.

Calling dispatcher: dispatcher which originates the VGCS call.

Destination dispatcher: Pre-registered dispatcher to which the VGCS call is directed.

Destination subscriber: Destination dispatcher(s) and/ or destination service subscriber(s) to which the VGCS call is directed.

Group call area: Predefined area composed of one or a cluster of cells to which a particular VGCS call is distributed. The maximum number of group call area Ids which can be defined in one PLMN depends on the maximum number of group Ids defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, The composition of a group call area is predefined in the network by the service provider. Changing of cell allocation in the network due to operational reasons will need an adaptation of the group call area definition. The group call area may include more then one MSC area and cells of more than one PLMN.

Group call member: Any service subscriber or dispatcher participating in an on going voice group call.

Originator-to-dispatcher information: Information sent by the service subscriber originating a voice group call to the network during call setup for distribution to the dispatchers to be attached to the group call during call setup.

3.2 Abbreviations

Abbreviations used in the present document are listed in 3G TR 41.004.

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

c) Destination subscribers are all destination service subscribers or a group of destination service subscribers identified by the called group ID which have their present location in the group call area, and pre-registered destination dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the subscriber individually. Destination ~~Dispatchers~~ 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 calling 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 calling 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~~ be given some ~~audible~~ indication if any dispatchers are also talking ~~simultaneously~~.

NOTE 1: The indication may be just the dispatcher's voice.

A ~~D~~dispatcher shall be able to talk at any moment ~~without any need to~~, but the network operator may require him to signal the wish to talk to the network. If the network operator requires a dispatcher to indicate his wish to talk then a dispatcher in that network shall also indicate that he has finished speaking.

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 service subscriber or calling dispatcher 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 service subscribers or calling dispatchers 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 service subscriber or by an entitled dispatcher or by the network.

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

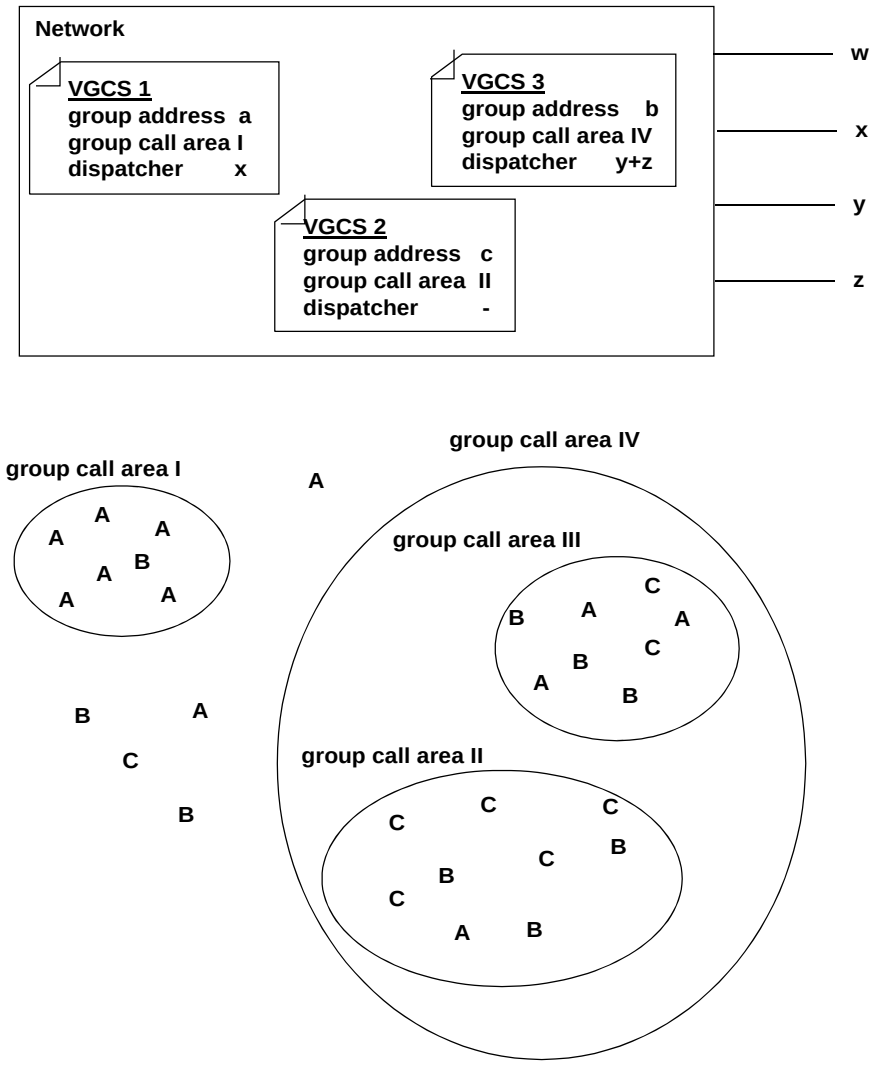
l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination service subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed 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.

Mobile users that are configured as Ddispatchers and which are registered in the network 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.

n- The calling service 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.



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

5 Normal operation with successful outcome

5.1 Provision

The VGCS is provided to be used by the service subscriber after prior arrangements with the service provider. The provision includes the assignment of group Ids to the service subscriber. A subscription shall not provide more than 50 group Ids to the service subscriber.

The service can be offered with one subscription option:

Subscription option	**Value**
- subscriber has the capability of initiating voice group calls in case of roaming	- No

- Yes.

5.2 Withdrawal

The VGCS is withdrawn at the service provider's request or for administrative reasons.

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 recipient ~~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.

5.4 Normal operation for voice group call establishment

The VGCS shall be automatically initiated by the network when a calling service subscriber or calling dispatcher dials a particular short code or address at call set-up.

On successful initiation of the VGCS, the voice group call shall be established between the calling service subscriber or calling dispatcher and the destination subscribers. The destination subscribers are:

- all destination service subscribers at any time during the voice group call with the corresponding active group ID when located in the group call area where the group call area is uniquely defined by:
  - the location (radio cell) of the calling service subscriber at invocation if the call is originated by a calling ~~subscriber is a~~ service subscriber;
  - the addressed group call area if the call is originated by a calling ~~subscriber is a~~ dispatcher;
- the pre-registered destination dispatchers related to that group call area and group ID.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that the user can start to speak.

The call can be released by the calling service subscriber or by the calling dispatcher or by the network or by an entitled dispatcher~~s~~ predefined in the network.

Destination subscribers may exit the voice group call separately without releasing the complete voice group call.

5.5 Charging requirements

Event data may be recorded as a network option as defined in 3G TS 32.005 for all VGCS calls to one group ID in a specific group call area. In addition other~~l~~ data to be passed to the anchor MSC for charging purposes are the identities of the talking subscribers, the time in which they were active and the resources (i.e. cell identities) used during a call.

5.6 Security requirements

VGCS shall be able to support over-the-air ciphering in order to provide confidentiality protection to group calls.

VGCS ciphering is an operator's option.

VGCS shall provide means such that only a legitimate service subscriber is able to participate in a ciphered VGCS call when the operator requires confidentiality protection for the group call. To include a subscriber into a ciphered voice group the required group data shall be stored on the USIM. Storing these group data on the USIM may be done e.g.

during the USIM personalisation process or via OTA (over-the-air) provisioning.

A pre- Rel-6 VGCS capable mobile shall be able to participate in an un-ciphered group call, if it is part of that group.

6 Exceptional procedures or unsuccessful outcome

If a service subscriber wants to establish a voice group call while not subscribed to the service or the network cannot provide the service for some reason, an indication will be provided to the calling service subscriber to notify him of the reason of failure.

If a dispatcher wants to establish a voice group call while not entitled to do it or the network cannot provide the service for some reason, the call shall be rejected. The network shall give an appropriate indication to calling dispatchers who are GSM subscribers.

If a voice group call cannot be established to all cells and dispatchers in a pre-set time, the call will be considered established provided that at least the originating cell in case of a service subscriber originated voice group call or any one cell within the group call area in case of a dispatcher originated voice group call has been included within this specified time.

If a cell is excluded from the group call area because of pre-emption, the voice group call shall be maintained.

7 Interaction with other GSM services

7.1 Calling Line Identification Presentation (CLIP)

If CLIP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the destination dispatchers. In addition the subaddress field of the calling party may be used to identify the calling service subscriber or calling dispatcher to the destination dispatchers.

The receiving mobile stations of the destination service subscribers shall display the paged group ID regardless the destination service subscribers have a subscription to CLIP.

7.2 Calling Line Identification Restriction (CLIR)

CLIR shall be supported.

The network shall have the possibility to override CLIR or reject the request to establish a voice group call for a calling service subscriber or calling dispatcher who has CLIR activated.

7.3 Connected Line Identification Presentation (COLP)

If COLP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the calling service subscriber or calling dispatcher. No destination subscriber identities will be presented.

TSG-SA WG1 #28 **S1-050470**
Beijing, China, 4th to 8th April 2005 **Agenda Item: 8**

CR-Form-v7

CHANGE REQUEST

⌘ **42.068** **CR** **009** ⌘ **rev** **-** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘	Correction on the use of calling subscriber and destination subscriber
Source:	⌘	SA1 (Nortel Networks, Siemens)
Work item code:	⌘	ASCI
Date:	⌘	14/03/2005
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
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Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	According to the definition in 3.1 in 42.068, a calling subscriber can be a service subscriber or a dispacher. However, the behaviour of each of these and their handling in the network is different. The stage 1 does not reflect the functionality that is currently in the network. Currently, there are two different implementations in the field due to this 2G (GSM) specification being unclear, which has to be corrected. The ambiguities the use of 'calling subscriber' creates in the specification need to be corrected. Likewise a destination subscriber can be a service subscriber or a dispatcher and the specification needs to be corrected in a similar way.
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Clauses affected:	⌘	3.1, 4, 5.4, 6 & 7

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****** *First Changed Section* ******

3 Definitions and abbreviations

3.1 Definitions

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3.2 Abbreviations

Abbreviations used in the present document are listed in 3G TR 41.0043GPP TR 21.905.

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 service subscriber or calling dispatcher 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.

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A Ddispatcher shall be able to talk at any moment without any need to , but the network operator may require him to signal the wish to talk to the network. If the network operator requires a dispatcher to indicate his wish to talk then a dispatcher in that network shall also indicate that he has finished speaking.

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 service subscriber or calling dispatcher 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 service subscribers or calling dispatchers 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 service subscriber or by an entitled dispatcher or by the network.

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

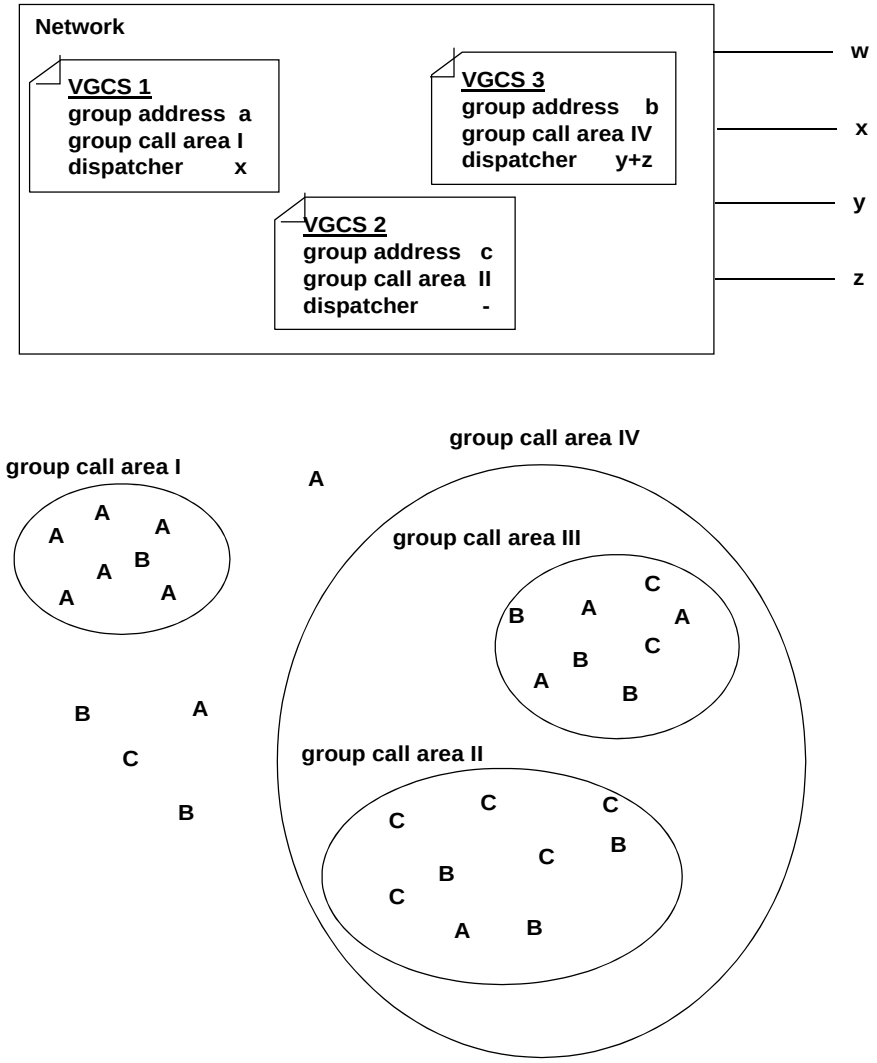
l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination service subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed 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.

Mobile users that are configured as Ddispatchers and which are registered in the network 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.

n- The calling service 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.



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

5 Normal operation with successful outcome

5.1 Provision

The VGCS is provided to be used by the service subscriber after prior arrangements with the service provider. The provision includes the assignment of group Ids to the service subscriber. A subscription shall not provide more than 50 group Ids to the service subscriber.

The service can be offered with one subscription option:

	Subscription option	**Value**
-	subscriber has the capability of initiating voice group calls in case of roaming	- No

- Yes.

5.2 Withdrawal

The VGCS is withdrawn at the service provider's request or for administrative reasons.

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 recipient ~~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.

5.4 Normal operation for voice group call establishment

The VGCS shall be automatically initiated by the network when a calling service subscriber or calling dispatcher dials a particular short code or address at call set-up.

On successful initiation of the VGCS, the voice group call shall be established between the calling service subscriber or calling dispatcher and the destination subscribers. The destination subscribers are:

- all destination service subscribers at any time during the voice group call with the corresponding active group ID when located in the group call area where the group call area is uniquely defined by:
  - the location (radio cell) of the calling service subscriber at invocation if the call is originated by a calling ~~subscriber is a~~ service subscriber;
  - the addressed group call area if the call is originated by a calling ~~subscriber is a~~ dispatcher;
- the pre-registered destination dispatchers related to that group call area and group ID.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that the user can start to speak.

The call can be released by the calling service subscriber or by the calling dispatcher or by the network or by an entitled dispatcher~~s~~ predefined in the network.

Destination subscribers may exit the voice group call separately without releasing the complete voice group call.

5.5 Charging requirements

Event data may be recorded as a network option as defined in 3G TS 32.005 for all VGCS calls to one group ID in a specific group call area. In addition other~~l~~ data to be passed to the anchor MSC for charging purposes are the identities of the talking subscribers, the time in which they were active and the resources (i.e. cell identities) used during a call.

5.6 Security requirements

VGCS shall be able to support over-the-air ciphering in order to provide confidentiality protection to group calls.

VGCS ciphering is an operator's option.

VGCS shall provide means such that only a legitimate service subscriber is able to participate in a ciphered VGCS call when the operator requires confidentiality protection for the group call. To include a subscriber into a ciphered voice group the required group data shall be stored on the USIM. Storing these group data on the USIM may be done e.g.

during the USIM personalisation process or via OTA (over-the-air) provisioning.

A pre- Rel-6 VGCS capable mobile shall be able to participate in an un-ciphered group call, if it is part of that group.

6 Exceptional procedures or unsuccessful outcome

If a service subscriber wants to establish a voice group call while not subscribed to the service or the network cannot provide the service for some reason, an indication will be provided to the calling service subscriber to notify him of the reason of failure.

If a dispatcher wants to establish a voice group call while not entitled to do it or the network cannot provide the service for some reason, the call shall be rejected. The network shall give an appropriate indication to calling dispatchers who are GSM subscribers.

If a voice group call cannot be established to all cells and dispatchers in a pre-set time, the call will be considered established provided that at least the originating cell in case of a service subscriber originated voice group call or any one cell within the group call area in case of a dispatcher originated voice group call has been included within this specified time.

If a cell is excluded from the group call area because of pre-emption, the voice group call shall be maintained.

7 Interaction with other GSM services

7.1 Calling Line Identification Presentation (CLIP)

If CLIP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the destination dispatchers. In addition the subaddress field of the calling party may be used to identify the calling service subscriber or calling dispatcher to the destination dispatchers.

The receiving mobile stations of the destination service subscribers shall display the paged group ID regardless the destination service subscribers have a subscription to CLIP.

7.2 Calling Line Identification Restriction (CLIR)

CLIR shall be supported.

The network shall have the possibility to override CLIR or reject the request to establish a voice group call for a calling service subscriber or calling dispatcher who has CLIR activated.

7.3 Connected Line Identification Presentation (COLP)

If COLP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the calling service subscriber or calling dispatcher. No destination subscriber identities will be presented.

TSG-SA WG1 #28 **S1-050471**
Beijing, China, 4th to 8th April 2005 **Agenda Item: 8**

CR-Form-v7

CHANGE REQUEST

⌘ **42.068**	**CR**	**010**	⌘ **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 [X]

Title:	⌘	Correction on the use of calling subscriber and destination subscriber
Source:	⌘	SA1 (Nortel Networks, Siemens)
Work item code:	⌘	ASCI — ***Date:*** ⌘ 7/4/2005
Category:	⌘	**A** — ***Release:*** ⌘ Rel-5
		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)* *Rel-7 (Release 7)*

Reason for change:	⌘	According to the definition in 3.1 in 42.068, a calling subscriber can be a service subscriber or a dispacher. However, the behaviour of each of these and their handling in the network is different. The stage 1does not reflect the functionality that is currently in the nework. Currently, there are two different implementations in the field due to this 2G (GSM) specification being unclear, which has to be corrected. The ambiguities the use of 'calling subscriber' creates in the specification need to be corrected. Likewise a destination subscriber can be a service subscriber or a dispatcher and the specification needs to be corrected in a similar way.
Summary of change:	⌘	Added definition for 'calling service subscriber', 'calling dispatcher', 'destination service subscriber', 'destination dispatcher' and 'destination subscriber(s)'. Deletion of definition of 'calling subscriber' and definition of 'destination subscriber'. Made corrections thoughout the specification using the new definitions. Also, a Note is added in Section 4 (e) to explain that the indication which the talking subscriber recieves when a dispatcher is also talking may be the dispatcher's voice.
Consequences if not approved:	⌘	Incorrect and misleading specification will cause problem in interoperability.

Clauses affected:	⌘	3.1, 4, 5.4, 6 & 7

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	43.068
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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 Changed Section* ******

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

~~network~~ Network operator: Entity which provides the network operating elements and resources for the execution of the VGCS.

Service provider: Entity which offers the VGCS for subscription. The network operator may be the service provider.

Voice group call: An instance of the VGCS initiated by a subscriber. This term is used synonymously with the term "VGCS call".

Service subscriber: Mobile subscriber which subscribes to the VGCS.

Group identification (group ID): A numerical classification. The maximum number of group Ids which can be defined in one PLMN depends on the maximum number of group call areas defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, Service subscriber shall be provided with one or up to 50 group Ids.

Dispatcher: Particular fixed line or mobile users are identified within the network as dispatchers. Dispatchers shall receive all voice group calls to a certain group ID in a group call area (this shall be done automatically by the network). In addition they can initiate voice group calls to a group ID in a group call area.

Dispatchers shall be connected to a voice group call by means of standard links via radio or via an ISDN. They shall be called by their MSISDN or ~~MS~~ISDN number, respectively. When dispatchers initiate voice group calls, they shall call a particular MSISDN number which is related to a group ID and group call area. Dispatchers using the GSM network can be located outside of this group call area.

The identities of the dispatchers are exclusively predefined in the network by the service provider. There will be none or up to five dispatchers involved in a particular voice group call.

Destination service subscriber: Service subscriber ~~or dispatcher~~ to which the VGCS call is directed.

Calling service subscriber: Service subscriber ~~or dispatcher~~ which originates the VGCS call.

Calling dispatcher: dispatcher which originates the VGCS call.

Destination dispatcher: Pre-registered dispatcher to which the VGCS call is directed.

Destination subscriber: Destination dispatcher(s) and/ or destination service subscriber(s) to which the VGCS call is directed.

Group call area: Predefined area composed of one or a cluster of cells to which a particular VGCS call is distributed. The maximum number of group call area Ids which can be defined in one PLMN depends on the maximum number of group Ids defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, The composition of a group call area is predefined in the network by the service provider. Changing of cell allocation in the network due to operational reasons will need an adaptation of the group call area definition. The group call area may include more then one MSC area and cells of more than one PLMN.

Group call member: Any service subscriber or dispatcher participating in an on going voice group call.

Originator-to-dispatcher information: Information sent by the service subscriber originating a voice group call to the network during call setup for distribution to the dispatchers to be attached to the group call during call setup.

3.2 Abbreviations

Abbreviations used in the present document are listed in 3G TR 41.0043GPP TR 21.905.

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 service subscriber or calling dispatcher 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 service subscriber as well as the destination service subscribers may be any service subscriber which has subscribed to the related group ID. or anyThe calling dispatcher may be any dispatcher who is entitled to originate VGCS calls to the related call reference. it by his identity which shall be registered in the network.

c) Destination subscribers are all destination service subscribers or a group of destination service subscribers identified by the called group ID which have their present location in the group call area, and pre-registered destination dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the subscriber individually. Destination Dispatchers 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 calling 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 calling 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 be given some audible indication if any dispatchers are also talking simultaneously.

NOTE 1: The indication may be just the dispatcher's voice.

A Ddispatcher shall be able to talk at any moment without any need to , but the network operator may require him to signal the wish to talk to the network. If the network operator requires a dispatcher to indicate his wish to talk then a dispatcher in that network shall also indicate that he has finished speaking.

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 service subscriber or calling dispatcher 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 service subscribers or calling dispatchers 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 service subscriber or by an entitled dispatcher or by the network.

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

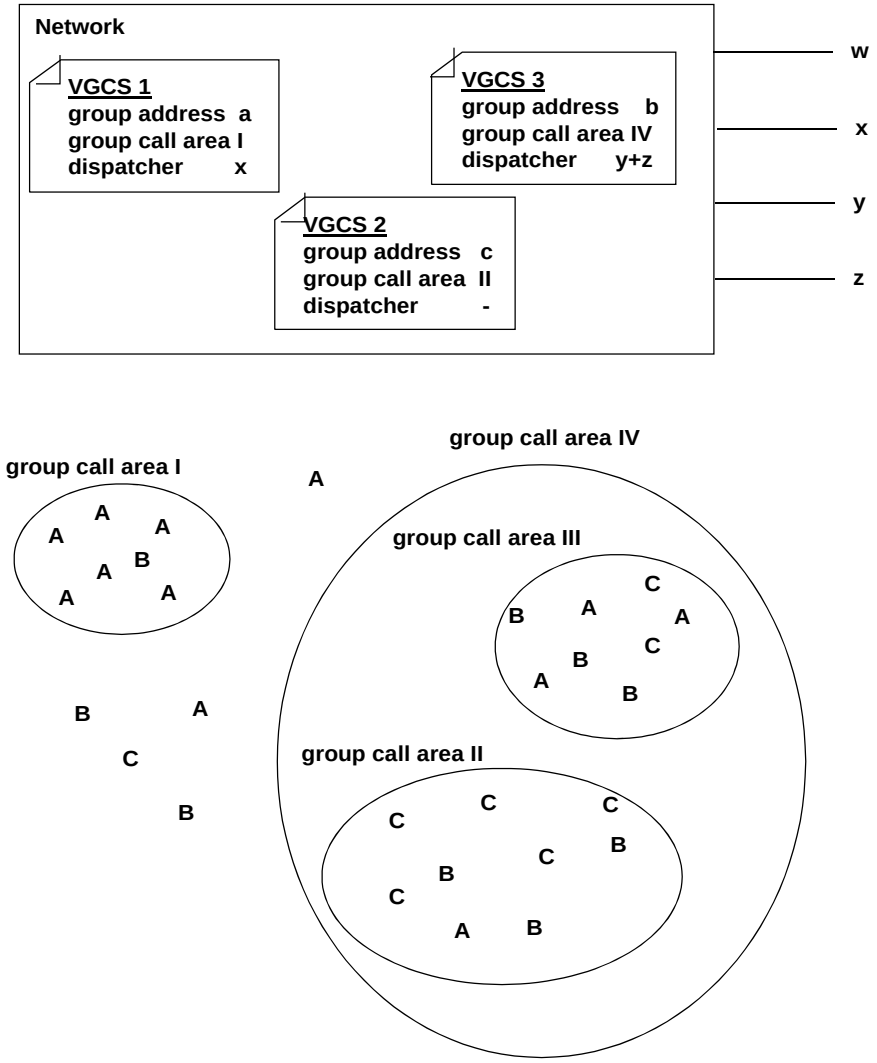
l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination service subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed 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.

Mobile users that are configured as Ddispatchers and which are registered in the network 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.

n- The calling service 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.



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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

5 Normal operation with successful outcome

5.1 Provision

The VGCS is provided to be used by the service subscriber after prior arrangements with the service provider. The provision includes the assignment of group Ids to the service subscriber. A subscription shall not provide more than 50 group Ids to the service subscriber.

The service can be offered with one subscription option:

Subscription option	Value
- subscriber has the capability of initiating voice group calls in case of roaming	- No

- Yes.

5.2 Withdrawal

The VGCS is withdrawn at the service provider's request or for administrative reasons.

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 recipient ~~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.

5.4 Normal operation for voice group call establishment

The VGCS shall be automatically initiated by the network when a calling service subscriber or calling dispatcher dials a particular short code or address at call set-up.

On successful initiation of the VGCS, the voice group call shall be established between the calling service subscriber or calling dispatcher and the destination subscribers. The destination subscribers are:

- all destination service subscribers at any time during the voice group call with the corresponding active group ID when located in the group call area where the group call area is uniquely defined by:
  - the location (radio cell) of the calling service subscriber at invocation if the call is originated by a calling ~~subscriber is a~~ service subscriber;
  - the addressed group call area if the call is originated by a calling ~~subscriber is a~~ dispatcher;
- the pre-registered destination dispatchers related to that group call area and group ID.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that the user can start to speak.

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Destination subscribers may exit the voice group call separately without releasing the complete voice group call.

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Event data may be recorded as a network option as defined in 3G TS 32.005 for all VGCS calls to one group ID in a specific group call area. In addition other~~l~~ data to be passed to the anchor MSC for charging purposes are the identities of the talking subscribers, the time in which they were active and the resources (i.e. cell identities) used during a call.

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VGCS shall be able to support over-the-air ciphering in order to provide confidentiality protection to group calls.

VGCS ciphering is an operator's option.

VGCS shall provide means such that only a legitimate service subscriber is able to participate in a ciphered VGCS call when the operator requires confidentiality protection for the group call. To include a subscriber into a ciphered voice group the required group data shall be stored on the USIM. Storing these group data on the USIM may be done e.g.

during the USIM personalisation process or via OTA (over-the-air) provisioning.

A pre- Rel-6 VGCS capable mobile shall be able to participate in an un-ciphered group call, if it is part of that group.

6 Exceptional procedures or unsuccessful outcome

If a service subscriber wants to establish a voice group call while not subscribed to the service or the network cannot provide the service for some reason, an indication will be provided to the calling service subscriber to notify him of the reason of failure.

If a dispatcher wants to establish a voice group call while not entitled to do it or the network cannot provide the service for some reason, the call shall be rejected. The network shall give an appropriate indication to calling dispatchers who are GSM subscribers.

If a voice group call cannot be established to all cells and dispatchers in a pre-set time, the call will be considered established provided that at least the originating cell in case of a service subscriber originated voice group call or any one cell within the group call area in case of a dispatcher originated voice group call has been included within this specified time.

If a cell is excluded from the group call area because of pre-emption, the voice group call shall be maintained.

7 Interaction with other GSM services

7.1 Calling Line Identification Presentation (CLIP)

If CLIP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the destination dispatchers. In addition the subaddress field of the calling party may be used to identify the calling service subscriber or calling dispatcher to the destination dispatchers.

The receiving mobile stations of the destination service subscribers shall display the paged group ID regardless the destination service subscribers have a subscription to CLIP.

7.2 Calling Line Identification Restriction (CLIR)

CLIR shall be supported.

The network shall have the possibility to override CLIR or reject the request to establish a voice group call for a calling service subscriber or calling dispatcher who has CLIR activated.

7.3 Connected Line Identification Presentation (COLP)

If COLP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the calling service subscriber or calling dispatcher. No destination subscriber identities will be presented.

TSG-SA WG1 #28 **S1-050472**
Beijing, China, 4th to 8th April 2005 **Agenda Item: 8**

CR-Form-v7

CHANGE REQUEST

⌘ 42.068	CR 011	⌘ rev -	⌘ Current version: 6.0.0 ⌘

*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 [X]

Title: ⌘	Correction on the use of calling subscriber and destination subscriber		
Source: ⌘	SA1 (Nortel Networks, Siemens)		
Work item code: ⌘	ASCI	***Date:*** ⌘	07/04/2005
Category: ⌘	**A**	***Release:*** ⌘	Rel-6
	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)* *Rel-7 (Release 7)*

Reason for change: ⌘	According to the definition in 3.1 in 42.068, a calling subscriber can be a service subscriber or a dispacher. However, the behaviour of each of these and their handling in the network is different. The stage 1does not reflect the functionality that is currently in the nework. Currently, there are two different implementations in the field due to this 2G (GSM) specification being unclear, which has to be corrected. The ambiguities the use of 'calling subscriber' creates in the specification need to be corrected. Likewise a destination subscriber can be a service subscriber or a dispatcher and the specification needs to be corrected in a similar way.
Summary of change: ⌘	Added definition for 'calling service subscriber', 'calling dispatcher', 'destination service subscriber', 'destination dispatcher' and 'destination subscriber(s)'. Deletion of definition of 'calling subscriber' and definition of 'destination subscriber'. Made corrections thoughout the specification using the new definitions. Also, a Note is added in Section 4 (e) to explain that the indication which the talking subscriber recieves when a dispatcher is also talking may be the dispatcher's voice.
Consequences if not approved: ⌘	Incorrect and misleading specification will cause problem in interoperability.

Clauses affected: ⌘	3.1, 4, 5.4, 6 & 7

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	43.068
			X	Test specifications		
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Other comments:	⌘					

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****** *First Changed Section* ******

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

~~network~~ Network operator: Entity which provides the network operating elements and resources for the execution of the VGCS.

Service provider: Entity which offers the VGCS for subscription. The network operator may be the service provider.

Voice group call: An instance of the VGCS initiated by a subscriber. This term is used synonymously with the term "VGCS call".

Service subscriber: Mobile subscriber which subscribes to the VGCS.

Group identification (group ID): A numerical classification. The maximum number of group Ids which can be defined in one PLMN depends on the maximum number of group call areas defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, Service subscriber shall be provided with one or up to 50 group Ids.

Dispatcher: Particular fixed line or mobile users are identified within the network as dispatchers. Dispatchers shall receive all voice group calls to a certain group ID in a group call area (this shall be done automatically by the network). In addition they can initiate voice group calls to a group ID in a group call area.

Dispatchers shall be connected to a voice group call by means of standard links via radio or via an ISDN. They shall be called by their MSISDN or ~~MS~~ISDN number, respectively. When dispatchers initiate voice group calls, they shall call a particular MSISDN number which is related to a group ID and group call area. Dispatchers using the GSM network can be located outside of this group call area.

The identities of the dispatchers are exclusively predefined in the network by the service provider. There will be none or up to five dispatchers involved in a particular voice group call.

Destination service subscriber: Service subscriber ~~or dispatcher~~ to which the VGCS call is directed.

Calling service subscriber: Service subscriber ~~or dispatcher~~ which originates the VGCS call.

Calling dispatcher: dispatcher which originates the VGCS call.

Destination dispatcher: Pre-registered dispatcher to which the VGCS call is directed.

Destination subscriber: Destination dispatcher(s) and/ or destination service subscriber(s) to which the VGCS call is directed.

Group call area: Predefined area composed of one or a cluster of cells to which a particular VGCS call is distributed. The maximum number of group call area Ids which can be defined in one PLMN depends on the maximum number of group Ids defined in this PLMN. The maximum number of group Ids and group call areas combined is 10^8, The composition of a group call area is predefined in the network by the service provider. Changing of cell allocation in the network due to operational reasons will need an adaptation of the group call area definition. The group call area may include more then one MSC area and cells of more than one PLMN.

Group call member: Any service subscriber or dispatcher participating in an on going voice group call.

Originator-to-dispatcher information: Information sent by the service subscriber originating a voice group call to the network during call setup for distribution to the dispatchers to be attached to the group call during call setup.

3.2 Abbreviations

Abbreviations used in the present document are listed in 3GPP TR 21.905.

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

c) Destination subscribers are all destination service subscribers or a group of destination service subscribers identified by the called group ID which have their present location in the group call area, and pre-registered destination dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the subscriber individually. Destination ~~Dispatchers~~ 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 calling 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 calling 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~~ be given some ~~audible~~ indication if any dispatchers are also talking ~~simultaneously~~.

NOTE 1: The indication may be just the dispatcher's voice.

A ~~D~~dispatcher shall be able to talk at any moment ~~without any need to~~, but the network operator may require him to signal the wish to talk to the network. If the network operator requires a dispatcher to indicate his wish to talk then a dispatcher in that network shall also indicate that he has finished speaking.

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 service subscriber or calling dispatcher 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 service subscribers or calling dispatchers 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 service subscriber or by an entitled dispatcher or by the network.

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

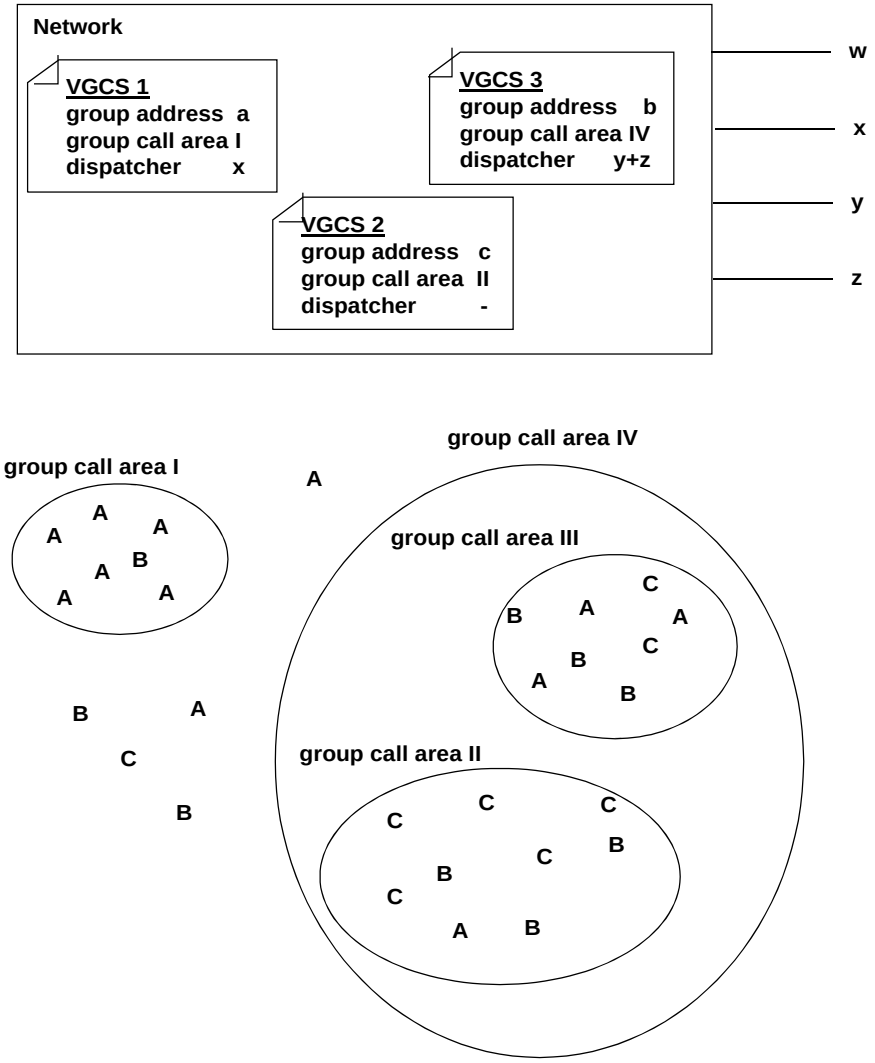
l) For certain levels of priorities an acknowledgement of receipt of a voice group call can be required as an application option (e.g. for railways emergency calls) from all or from nominated destination service subscribers (nomination is recorded on the SIM). The acknowledgement itself shall be performed 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.

Mobile users that are configured as Ddispatchers and which are registered in the network 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.

n- The calling service 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.



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

5 Normal operation with successful outcome

5.1 Provision

The VGCS is provided to be used by the service subscriber after prior arrangements with the service provider. The provision includes the assignment of group Ids to the service subscriber. A subscription shall not provide more than 50 group Ids to the service subscriber.

The service can be offered with one subscription option:

	Subscription option	**Value**
-	subscriber has the capability of initiating voice group calls in case of roaming	- No

- Yes.

5.2 Withdrawal

The VGCS is withdrawn at the service provider's request or for administrative reasons.

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 recipient ~~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.

5.4 Normal operation for voice group call establishment

The VGCS shall be automatically initiated by the network when a calling service subscriber or calling dispatcher dials a particular short code or address at call set-up.

On successful initiation of the VGCS, the voice group call shall be established between the calling service subscriber or calling dispatcher and the destination subscribers. The destination subscribers are:

- all destination service subscribers at any time during the voice group call with the corresponding active group ID when located in the group call area where the group call area is uniquely defined by:
  - the location (radio cell) of the calling service subscriber at invocation if the call is originated by a calling ~~subscriber is a~~ service subscriber;
  - the addressed group call area if the call is originated by a calling ~~subscriber is a~~ dispatcher;
- the pre-registered destination dispatchers related to that group call area and group ID.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that the user can start to speak.

The call can be released by the calling service subscriber or by the calling dispatcher or by the network or by an entitled dispatcher~~s~~ predefined in the network.

Destination subscribers may exit the voice group call separately without releasing the complete voice group call.

5.5 Charging requirements

Event data may be recorded as a network option as defined in 3G TS 32.005 for all VGCS calls to one group ID in a specific group call area. In addition other~~l~~ data to be passed to the anchor MSC for charging purposes are the identities of the talking subscribers, the time in which they were active and the resources (i.e. cell identities) used during a call.

5.6 Security requirements

VGCS shall be able to support over-the-air ciphering in order to provide confidentiality protection to group calls.

VGCS ciphering is an operator's option.

VGCS shall provide means such that only a legitimate service subscriber is able to participate in a ciphered VGCS call when the operator requires confidentiality protection for the group call. To include a subscriber into a ciphered voice group the required group data shall be stored on the USIM. Storing these group data on the USIM may be done e.g.

during the USIM personalisation process or via OTA (over-the-air) provisioning.

A pre- Rel-6 VGCS capable mobile shall be able to participate in an un-ciphered group call, if it is part of that group.

6 Exceptional procedures or unsuccessful outcome

If a service subscriber wants to establish a voice group call while not subscribed to the service or the network cannot provide the service for some reason, an indication will be provided to the calling service subscriber to notify him of the reason of failure.

If a dispatcher wants to establish a voice group call while not entitled to do it or the network cannot provide the service for some reason, the call shall be rejected. The network shall give an appropriate indication to calling dispatchers who are GSM subscribers.

If a voice group call cannot be established to all cells and dispatchers in a pre-set time, the call will be considered established provided that at least the originating cell in case of a service subscriber originated voice group call or any one cell within the group call area in case of a dispatcher originated voice group call has been included within this specified time.

If a cell is excluded from the group call area because of pre-emption, the voice group call shall be maintained.

7 Interaction with other GSM services

7.1 Calling Line Identification Presentation (CLIP)

If CLIP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the destination dispatchers. In addition the subaddress field of the calling party may be used to identify the calling service subscriber or calling dispatcher to the destination dispatchers.

The receiving mobile stations of the destination service subscribers shall display the paged group ID regardless the destination service subscribers have a subscription to CLIP.

7.2 Calling Line Identification Restriction (CLIR)

CLIR shall be supported.

The network shall have the possibility to override CLIR or reject the request to establish a voice group call for a calling service subscriber or calling dispatcher who has CLIR activated.

7.3 Connected Line Identification Presentation (COLP)

If COLP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the calling service subscriber or calling dispatcher. No destination subscriber identities will be presented.

TSG-SA WG1 #27 **S1-050477**
Beijing, China, 4th to 8th April 2005 **Agenda Item: 8**

CR-Form-v7

CHANGE REQUEST

⌘ **42.068** **CR** **012** ⌘ **rev** **-** ⌘ Current version: **7.2.0** ⌘

*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:	⌘	Correction on the use of calling subscriber and destination subscriber
Source:	⌘	SA1 (Nortel Networks, Siemens)
Work item code:	⌘	ASCI
Date:	⌘	07/04/2005
Category:	⌘	**A**
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)*
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Rel-4	*(Release 4)*
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Reason for change:	⌘	According to the definition in 3.1 in 42.068, a calling subscriber can be a service subscriber or a dispacher. However, the behaviour of each of these and their handling in the network is different. The stage 1does not reflect the functionality that is currently in the nework. Currently, there are two different implementations in the field due to this 2G (GSM) specification being unclear, which has to be corrected. The ambiguities the use of 'calling subscriber' creates in the specification need to be corrected. Likewise a destination subscriber can be a service subscriber or a dispatcher and the specification needs to be corrected in a similar way.
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This behaviour shall also apply if the mobile station is the calling service 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 service 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.

Mobile users that are configured as Ddispatchers and which are registered in the network 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.

n- The calling service 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.

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

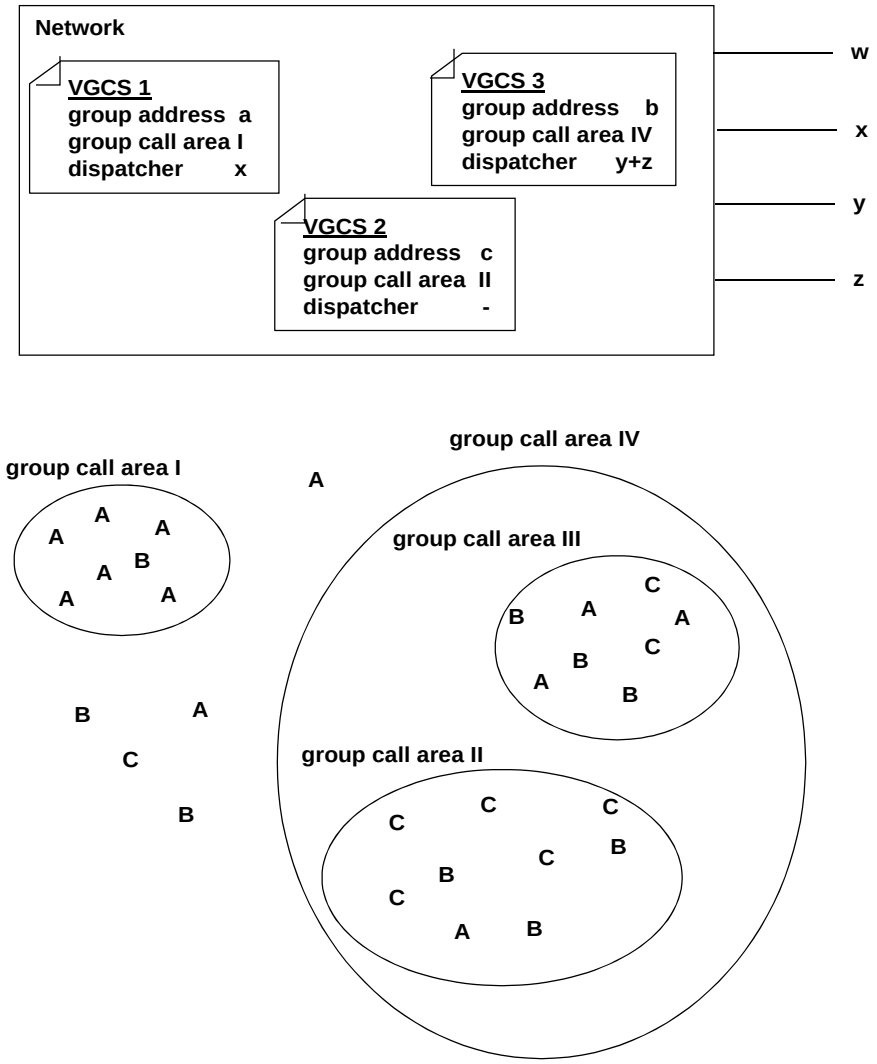
- A privileged service subscriber shall be able to release the current talker (i.e. the current talker shall become a listener, but not released from the call) and become the talker.

p~~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

q~~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

5 Normal operation with successful outcome

5.1 Provision

The VGCS is provided to be used by the service subscriber after prior arrangements with the service provider. The provision includes the assignment of group Ids to the service subscriber. A subscription shall not provide more than 50 group Ids to the service subscriber.

The service can be offered with one subscription option:

	Subscription option	**Value**
-	subscriber has the capability of initiating voice group calls in case of roaming	- No - Yes.

5.2 Withdrawal

The VGCS is withdrawn at the service provider's request or for administrative reasons.

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 recipient ~~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])

5.4 Normal operation for voice group call establishment

The VGCS shall be automatically initiated by the network when a calling service subscriber or calling dispatcher dials a particular short code or address at call set-up.

On successful initiation of the VGCS, the voice group call shall be established between the calling service subscriber or calling dispatcher and the destination subscribers. The destination subscribers are:

- all destination service subscribers at any time during the voice group call with the corresponding active group ID when located in the group call area where the group call area is uniquely defined by:
  - the location (radio cell) of the calling service subscriber at invocation if the call is originated by a calling ~~subscriber is a~~ service subscriber;
  - the addressed group call area if the call is originated by a calling ~~subscriber is a~~ dispatcher;
- the pre-registered destination dispatchers related to that group call area and group ID.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice group call so that the user can start to speak.

The call can be released by the calling service subscriber or by the calling dispatcher or by the network or by an entitled dispatcher~~s~~ predefined in the network.

Destination subscribers may exit the voice group call separately without releasing the complete voice group call.

5.5 Charging requirements

Event data may be recorded as a network option as defined in 3G TS 32.005 for all VGCS calls to one group ID in a specific group call area. In addition other~~l~~ data to be passed to the anchor MSC for charging purposes are the identities of the talking subscribers, the time in which they were active and the resources (i.e. cell identities) used during a call.

5.6 Security requirements

VGCS shall be able to support over-the-air ciphering in order to provide confidentiality protection to group calls.

VGCS ciphering is an operator's option.

VGCS shall provide means such that only a legitimate service subscriber is able to participate in a ciphered VGCS call when the operator requires confidentiality protection for the group call. To include a subscriber into a ciphered voice group the required group data shall be stored on the USIM. Storing these group data on the USIM may be done e.g. during the USIM personalisation process or via OTA (over-the-air) provisioning.

A pre- Rel-6 VGCS capable mobile shall be able to participate in an un-ciphered group call, if it is part of that group.

6 Exceptional procedures or unsuccessful outcome

If a service subscriber wants to establish a voice group call while not subscribed to the service or the network cannot provide the service for some reason, an indication will be provided to the calling service subscriber to notify him of the reason of failure.

If a dispatcher wants to establish a voice group call while not entitled to do it or the network cannot provide the service for some reason, the call shall be rejected. The network shall give an appropriate indication to calling dispatchers who are GSM subscribers.

If a voice group call cannot be established to all cells and dispatchers in a pre-set time, the call will be considered established provided that at least the originating cell in case of a service subscriber originated voice group call or any one cell within the group call area in case of a dispatcher originated voice group call has been included within this specified time.

If a cell is excluded from the group call area because of pre-emption, the voice group call shall be maintained.

7 Interaction with other GSM services

7.1 Calling Line Identification Presentation (CLIP)

If CLIP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the destination dispatchers. In addition the subaddress field of the calling party may be used to identify the calling service subscriber or calling dispatcher to the destination dispatchers.

The receiving mobile stations of the destination service subscribers shall display the paged group ID regardless the destination service subscribers have a subscription to CLIP.

7.2 Calling Line Identification Restriction (CLIR)

CLIR shall be supported.

The network shall have the possibility to override CLIR or reject the request to establish a voice group call for a calling service subscriber or calling dispatcher who has CLIR activated.

7.3 Connected Line Identification Presentation (COLP)

If COLP is applied, the group call reference – including the group call area ID and the group ID – shall be presented to the calling service subscriber or calling dispatcher. No destination subscriber identities will be presented.