3GPP TSG CN Plenary Meeting #17 **NP-020383**
4th - 6th September 2002. Biarritz, France.

Source: **TSG CN WG 1**

Title: **CRs to Rel-5 on Work Item TEI5 towards 23.009, 23.122, 24.007, 43.068 and 43.069**

Agenda item: **8.8**

Document for: **APPROVAL**

Introduction:

This document contains **5** CRs on **Rel-5 to** Work Item **"TEI5"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #17 for approval.

CR#080r1 have corresponding CRs in 3GPP TSs 22.129, 25.413, 25.401, 25.423, 29.002, 23.003, 29.010.

Spec	CR #	Rev	CAT	Rel	Tdoc Title	Meeting	TDoc #	C_Version
23.009	080	1	B	Rel-5	Support for Shared Network Area	N1-25	N1-021789	5.1.0
23.122	052	1	F	Rel-5	Applicability of the lists of "forbidden LAs"	N1-25	N1-021809	5.0.0
24.007	057	1	F	Rel-5	Clarification of the CN release indicators	N1-25	N1-021836	5.0.0
43.068	007		F	Rel-5	ASCI VGCS call termination by dispatchers using DTMF	N1-25	N1-021687	5.0.1
43.069	006		F	Rel-5	ASCI VBS call termination by dispatchers using DTMF	N1-25	N1-021688	5.0.1

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021687***
Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **43.068** **CR** **007** ⌘ **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:	⌘	ASCI VGCS call termination by dispatchers using DTMF
Source:	⌘	EPRT, Siemens AG, Nortel Networks, Sagem SA, Kapsch AG
Work item code:	⌘	TEI5
Date:	⌘	25.06.2002
Category:	⌘	**F**
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)

Reason for change:	⌘	In the earlier Releases of stage 1 and stage 2 of 42.068 and 43.068 (also 02.68 and 03.68) the release of VGCS call by dispatchers has been required. However, due to the fact that no technical solution was found, this issue has not been specified. This CR should complete this open issue.
Summary of change:	⌘	The technical solution of the termination of VGCS call by dispatchers is described.
Consequences if not approved:	⌘	The issue will still remain open. The requirement from stage 1 will not be fulfilled.

Clauses affected:	⌘	4.2.4, 11.3.2, 11.3.3, 11.3.8

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		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 MODIFICATION * * * * * * * * * * * * * * * * *

4.2.4 Group call termination

A voice group call can only be terminated by the calling subscriber or by an entitled dispatcher or due to no activity timer expiry (see subclause 8.1.2.3).

The calling subscriber can terminate the call only if the calling subscriber has access to the uplink. He shall remain the calling subscriber during the length of the particular voice group call even if he leaves the call and then returns to it later.

The dispatcher can terminate the call by a network defined user operation (~~e.g.~~ via DTMF).

* * * * * * * * * * * * * * NEXT MODIFICATION * * * * * * * * * * * * * * * * *

11.3.2 Call release

The voice group call can be terminated by the calling subscriber clearing it down, or by any dispatcher nominated in the GCR allowed to terminate the call.

11.3.2.1 Call termination by the calling subscriber

The calling subscriber will need to gain the uplink before he can issue a termination request. If this occurs a call release message shall be sent on the FACCH of all cells in the group call area and then all resources are freed.

The MSC has to store the identity of the calling subscriber and to check it against the identity of the service subscriber which sends the voice group call disconnect message.

A time-out mechanism is required, such that if the MSC does not detect any downlink activity (i.e. either uplink or dispatcher activity) for a pre-set time, the call is terminated by the network. For this a timer shall be provided with a length as defined in the group call attributes in the GCR or, as an implementation option, with a fixed length.

11.3.2.2 Call termination by dispatchers

A dispatcher entitled to terminate the call can be a mobile subscriber or a fixed line subscriber. The dispatcher may use out-of-band DTMF messages as a means for the control of the call termination, if it is a mobile dispatcher, or DTMF tones, if it is a fixed line dispatcher.

If the call is terminated by a mobile dispatcher using DTMF, the out-of-band messages START_DTMF(X) and STOP_DTMF are sent via the radio interface towards the network. If the out-of-band DTMF messages are sent by a mobile dispatcher who is not controlled by the anchor MSC, the DTMF messages will be converted by the controlling MSC (e.g. relay MSC or visited MSC) into DTMF tones and these DTMF tones will be sent through the network to the anchor MSC.

If a fixed dispatcher initiates DTMF tones, the DTMF tones will be sent through the network to the anchor MSC.

Both in case of a mobile and a fixed line dispatcher the anchor MSC is responsible for the detection and collection of the out-of-band or inband DTMF signals. After the evaluation of the DTMF signals, the anchor MSC shall trigger the appropriate function (see the figures 7b to 7d in 11.3.8).

In order to avoid the erroneous detection of the specific DTMF tone sequence for call termination by the MSC, this sequence shall consist of at least three DTMF digits.

11.3.3 Leaving of a dispatcher

A dispatcher can disconnect from the call at any time without terminating the call. In order to terminate the call a dispatcher who is entitled to do this must use the explicit signalling described in subclause 11.3.2.2~~(e.g. DTMF)~~.

~~NOTE: This signalling is currently not specified in the GSM technical specifications and left for operator specific solutions.~~

* * * * * * * * * * * * * * NEXT MODIFICATION * * * * * * * * * * * * * * * * * *

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 7~~a~~d.

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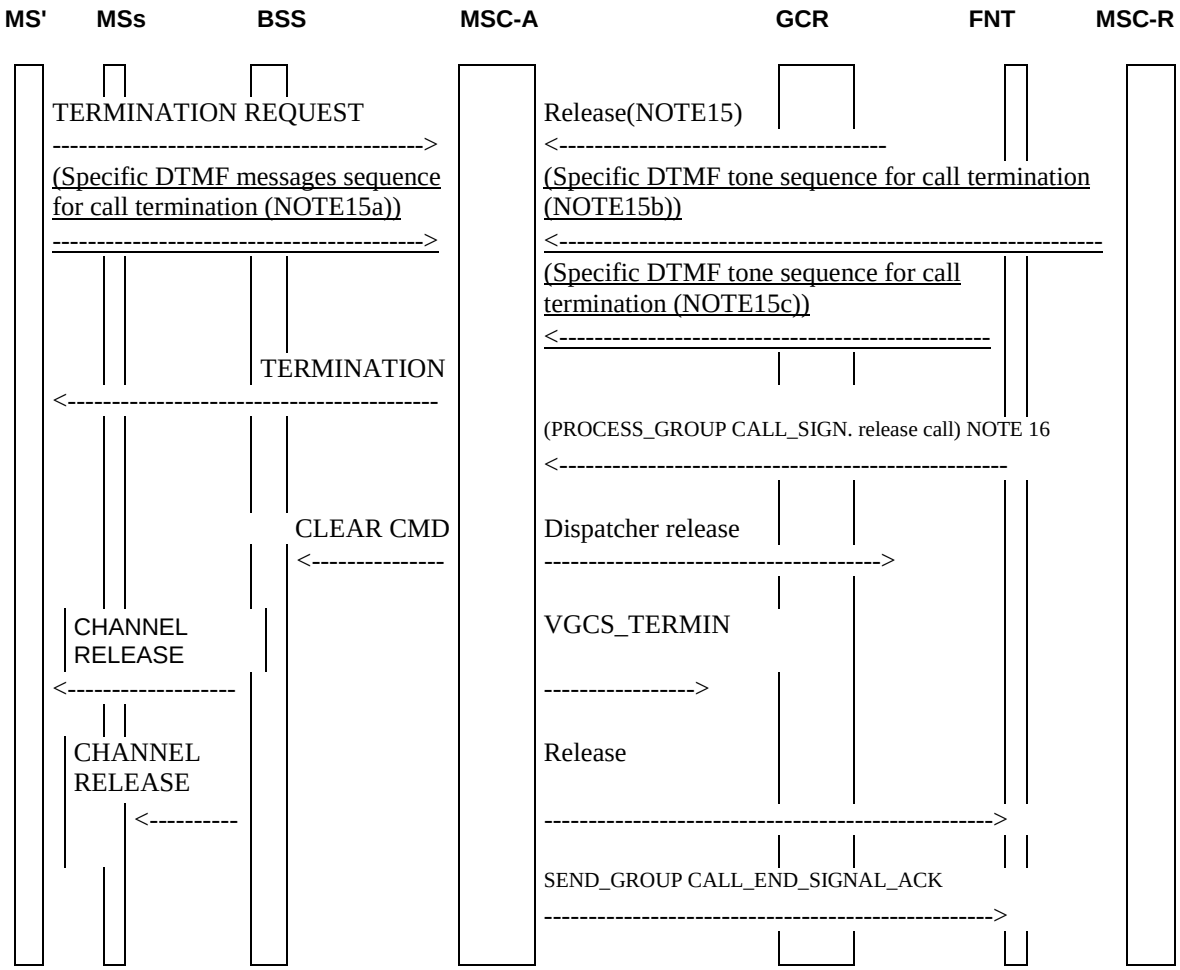

Figure 7: Signalling required to disconnect the group call

TERMINATION REQUEST: An authorized mobile station can send a TERMINATION REQUEST message to clear down the entire voice group call. To do this, the mobile station must have access to the uplink. The network has to check the IMSI to verify the calling subscriber. If the IMSI of the mobile station which has uplink access is presently not known to the network, the network shall send an identity request to the mobile station

NOTE 15: Alternatively an authorized dispatcher can terminate the voice group call in which case a release message is received from the external network.

NOTE 15a: Alternatively an authorized mobile dispatcher can terminate the voice group call by using a specific DTMF message sequence. If the mobile dispatcher is controlled by the anchor MSC, the specific DTMF message sequence is received by the anchor MSC (see Figure 7b).

NOTE 15b: If the mobile dispatcher is controlled by a relay MSC, the specific DTMF message sequence is received by the relay MSC. The relay MSC converts the DTMF messages into DTMF tones and sends them towards the anchor MSC (see Figure 7c).

NOTE 15c: Alternatively an authorized fixed line dispatcher can terminate the voice group call by using a specific DTMF tone sequence. In this case, the specific DTMF tone sequence is received by the anchor MSC (see Figures 7d).

NOTE 16: Alternatively an authorized mobile station currently served by a relay MSC can clear down the entire group call in which case a PROCESS_GROUP CALL_SIGNALLING message indicating call release is received from the relay MSC.

CLEAR CMD: This message is sent from the MSC to all related cells to disconnect calls from the conference bridge and stop all periodic notifications for the voice group call to be released.

VGCS_TERMIN: The MSC informs the GCR that the voice group call with the related group call reference is terminated.

CHANNEL RELEASE: CHANNEL RELEASE messages are sent on all downlink FACCH to the service subscribers. The CHANNEL RELEASE messages shall be repeated for a predefined period in order to provide a high probability that the listening mobile stations receive the message.

- CHANNEL RELEASE message is sent using I frame for the talker.
- CHANNEL RELEASE messages are sent using UI frames for listeners.

In addition, release messages are sent to all related dispatchers and relay MSCs.

SEND_GROUP CALL_END_SIGNAL_ACK: The dialogues to all relay MSCs are closed.

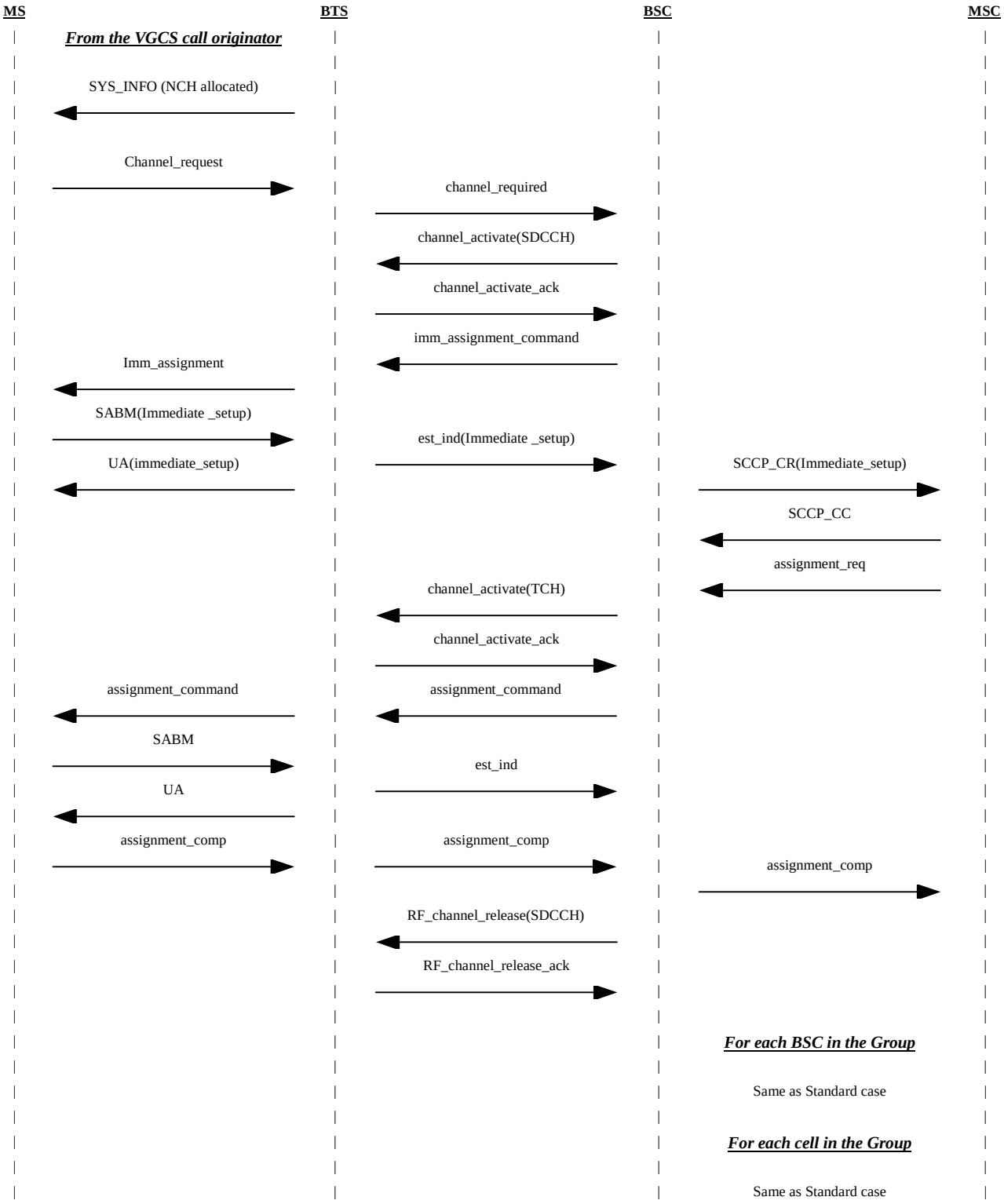

Figure 7a: Signalling information required for establishing voice group calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP: This message including all details of the voice group call is sent by the MS to the network in order to set-up a group call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 17: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

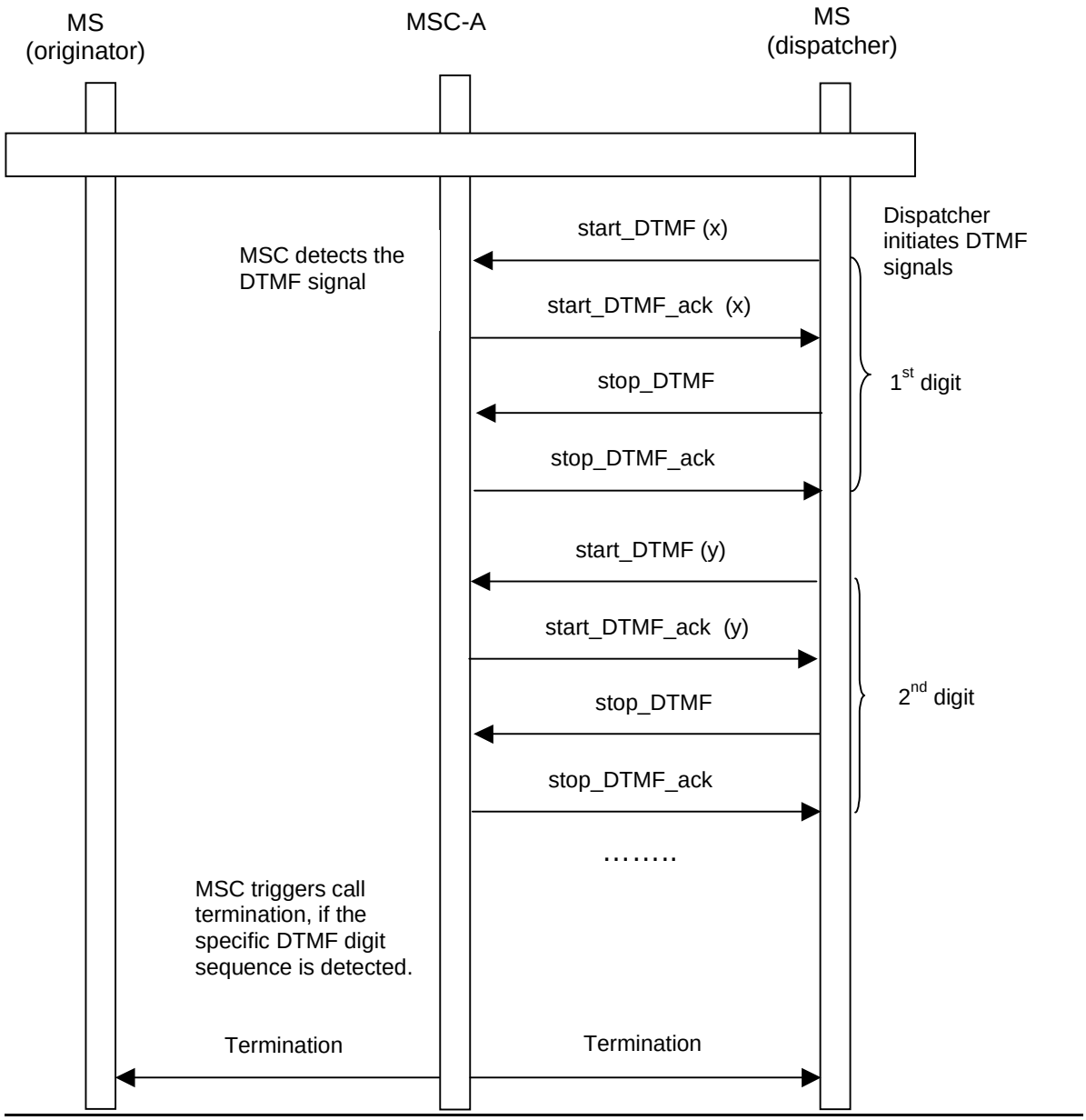

Figure 7b: Signalling required for group call termination by an entitled mobile dispatcher, if the mobile dispatcher is controlled by the anchor MSC of the group call.

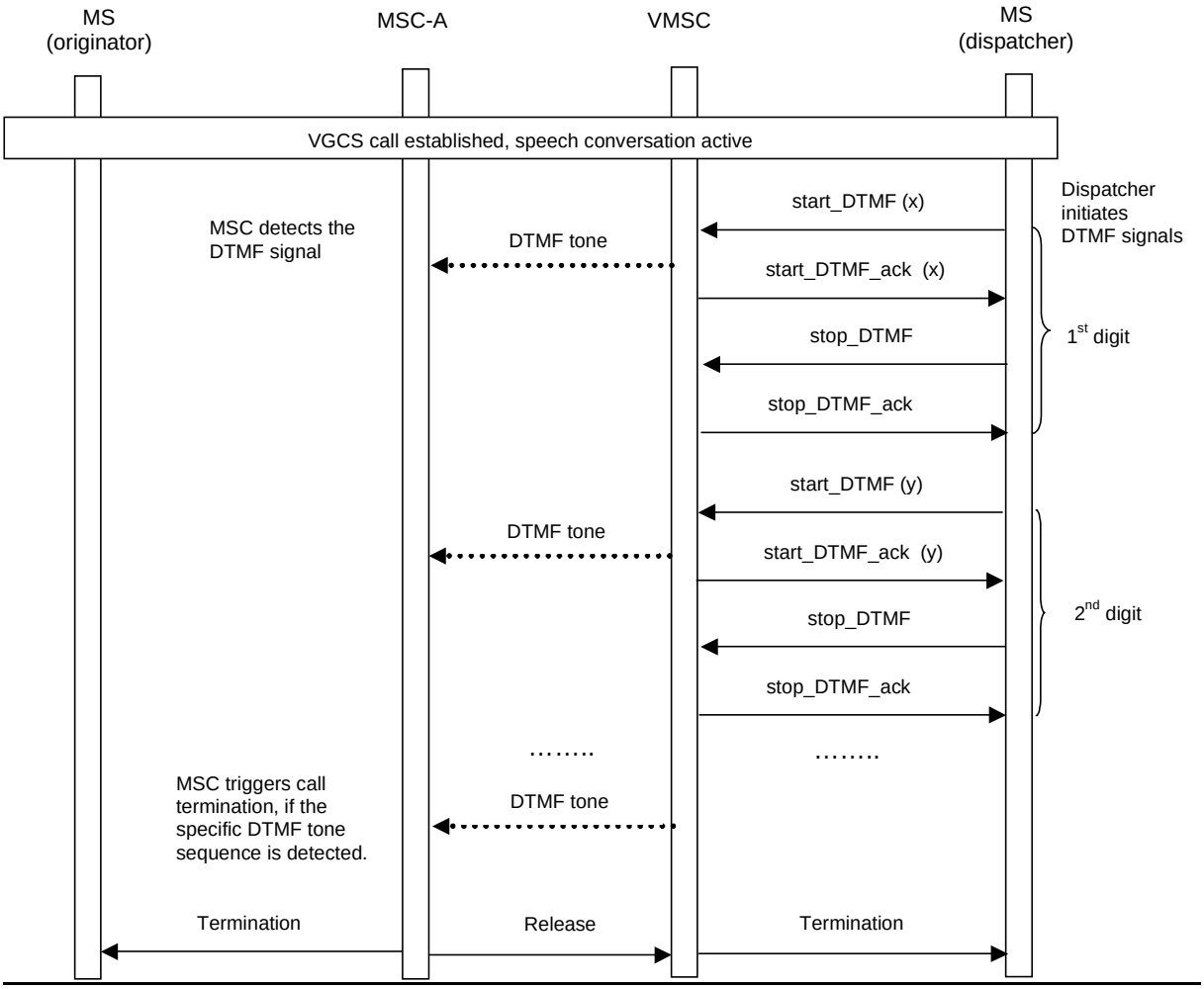

Figure 7c: Signalling required for group call termination by an entitled mobile dispatcher, if the mobile dispatcher is controlled by a visited MSC (could be a relay MSC) of the group call.

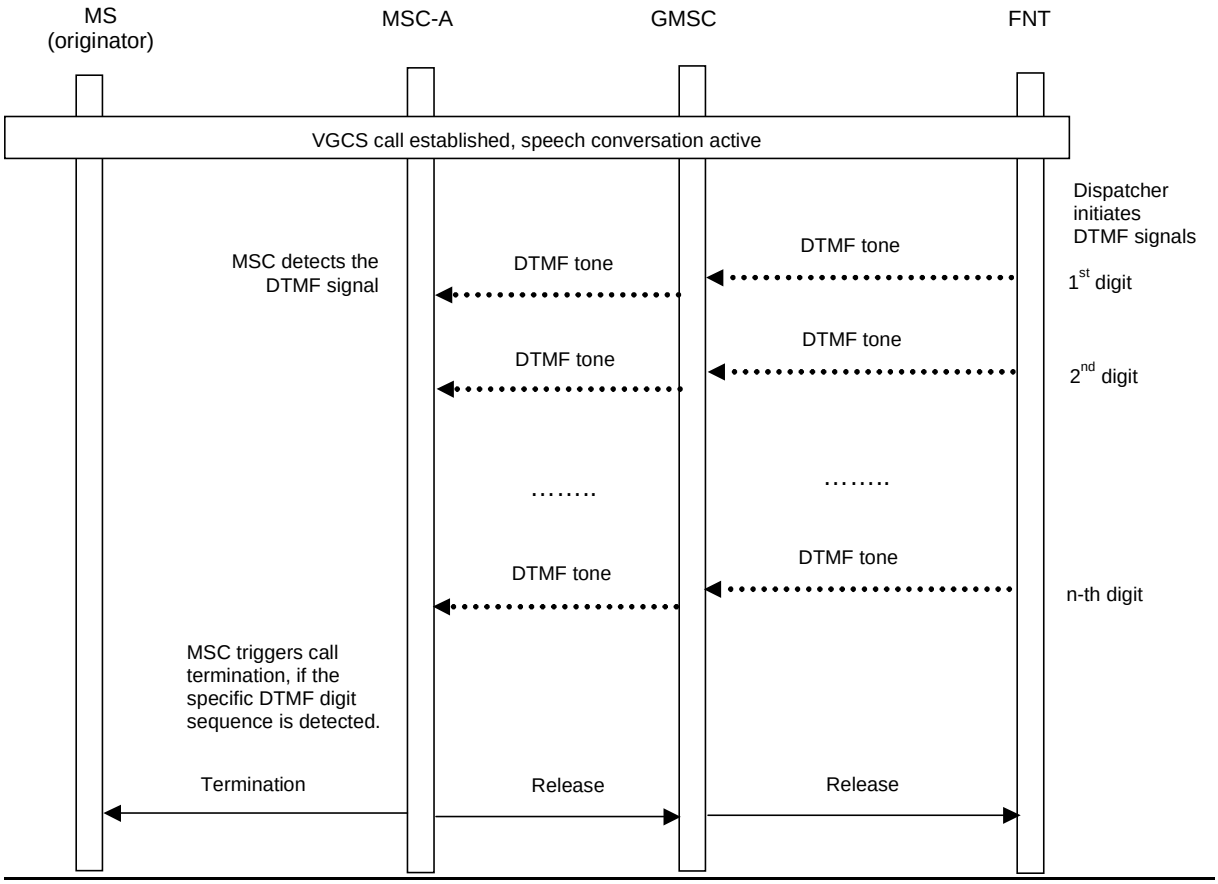

Figure 7d: Signalling required for group call termination by an entitled fixed line dispatcher

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11.4 Functional requirement of Anchor MSC

The VGCS handling process in the anchor MSC is shown in figure 8.

Successful call set-up

When the VGCS handling process in the anchor MSC receives a VGCS call set-up request from either a dispatcher or a service subscriber currently located in the anchor MSC's area or a service subscriber currently located in a relay MSC's area, it interrogates its associated GCR to retrieve the group call attributes, and waits for a response.

If the GCR returns a positive response containing the group call attributes, the anchor MSC sets up the downlinks to the cells inside the MSC area of the group call anchor MSC into which the call is to be sent, sets up the connections to the dispatchers to which a dedicated link is to be established, sets up the connections to the relay MSCs into which the call is to be sent, starts the No Activity Timer, sends Forward Group Call Signalling messages containing the IMSI of the service subscriber who has initiated the call -if the call was not initiated by a dispatcher- to all relay MSCs (however not to the relay MSC from which the IMSI was received within the Send Group Call End Signal message if the call was initiated by a service subscriber located in the relay MSC area), and waits for uplink management messages.

Procedure Set-up Connections to Relay MSCs

The procedure is shown in figure 9.

The procedure sends PREPARE_GROUP_CALL messages to all relay MSCs and waits for the responses.

If a positive response containing a Group Call number is received from a relay MSC, the anchor MSC constructs an IAM using the Group Call number as called party address, sends it to the relay MSC and waits for the SEND_GROUP CALL_END_SIGNAL message.

If the SEND_GROUP CALL_END_SIGNAL message is received, the procedure checks whether responses from other relay MSCs are outstanding. Relay MSCs that do not send positive responses on the PREPARE_GROUP_CALL message are no longer considered to belong to the list of relay MSCs for this VGCS call.

Negative response received from the GCR

If the GCR returns a negative response to the anchor MSC indicating that the call is already on-going, the anchor MSC checks whether the call was initiated by a dispatcher. If so, the dispatcher is connected to the on-going call and the process returns to the idle state. If the call was initiated by a service subscriber, a Release message indicating "user busy" is returned in order to force the mobile station of the service subscriber to look for notifications of the respective group ID on the NCH and join the group call.

If the negative response from the GCR indicates any other reason than "on-going call" the VGCS call set-up request is rejected by sending a release message back to the initiator and the process returns to the idle state.

Uplink management

If the anchor MSC receives an Uplink Release message from a BSC, it marks the uplink as free, sends Forward Group Call Signalling messages indicating "uplink release" indication to all relay MSCs, sends Uplink Release command messages to all other BSCs, restarts the No Activity Timer and waits for further uplink management messages.

If the anchor MSC receives an Uplink Request message from a BSC, it checks whether the uplink is marked as free. If so, an Uplink Request Confirm message is returned to the BSC, Forward Group Call Signalling messages indicating that the uplink is no longer free are sent to all relay MSCs, Uplink Seized Command messages are sent to all other BSCs, the uplink is marked busy and the process waits for further uplink management messages. If the uplink was not free when receiving the Uplink Request, the request is rejected.

If the anchor MSC receives an Uplink Cnf message from a BSC, it stores the received data and waits for further uplink management messages.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "uplink release indication", it marks the uplink as free, sends Forward Group Call Signalling messages indicating "uplink release indication" to all other relay MSCs, sends Uplink Release command messages to all BSCs, restarts the No Activity Timer and waits for further uplink management messages.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "uplink request", it checks whether the uplink is marked as free. If so, a Forward Group Call Signalling message indicating "uplink request confirm" is returned to the relay MSC, Forward Group Call Signalling messages indicating that the uplink is no longer free are sent to all other relay MSCs, Uplink Seized Command messages are sent to all BSCs, the uplink is marked busy and the process waits for further uplink management messages. If the uplink was not free when receiving the Process Group Call Signalling message (Uplink Request), the request is rejected.

If the anchor MSC receives an ABORT message from a relay MSC, the connection to the relay MSC is released and the relay MSC is no longer considered to be part of the call.

Call release

If the anchor MSC receives ~~a Release~~ the specific DTMF message sequence or the specific DTMF tone sequence for call termination from an entitled dispatcher (see Figures 7b to 7d) or a Termination Request message from the initiating service subscriber who currently has access to the uplink, it sends Send Group Call End Signal ACK messages to all relay MSCs, sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "release group call" or an ISUP Release message from a relay MSC indicating "Normal call clearing" while the initiating subscriber is still on a dedicated connection, then the anchor MSC sends Send Group Call End Signal ACK messages to all relay MSCs,

sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

If the no activity time in the anchor MSC expires indicating that no voice activity has been detected for the time specified in the GCR, the anchor MSC sends Send Group Call End Signal ACK messages to all relay MSCs, sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021688***
Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **43.069** **CR** **006** ⌘ **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:	⌘	ASCI VBS call termination by dispatchers using DTMF
Source:	⌘	EPRT, Siemens AG, Nortel Networks, Sagem SA, Kapsch AG
Work item code:	⌘	TEI5
Date:	⌘	25.06.2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In the earlier Releases of stage 1 and stage 2 of 42.069 and 43.069 (also 02.69 and 03.69) the release of VBS call by dispatchers has been required. However, due to the fact that no technical solution was found, this issue has not been specified. This CR should complete this open issue.
Summary of change:	⌘	The technical solution of the termination of VBS call by dispatchers is described.
Consequences if not approved:	⌘	The issue will still remain open. The requirement from stage 1 will not be fulfilled.

Clauses affected:	⌘	11.3.2, 11.3.3, 11.3.8

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

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* * * * * * * * * * * * * FIRST MODIFICATION * * * * * * * * * * * * * * * * *

11.3.2 Call release

The voice broadcast call can be terminated by the calling subscriber clearing it down, or by any dispatcher nominated in the GCR allowed to terminate the call.

11.3.2.1 Call termination by the calling subscriber

If the calling subscriber issues a termination request~~this occurs~~ a call release message shall be sent on the FACCH of all cells in the group call area and then all resources are freed.

11.3.2.2 Call termination by dispatchers

A dispatcher entitled to terminate the call can be a mobile subscriber or a fixed line subscriber. The dispatcher may use out-of-band DTMF messages as a means for the control of the call termination, if it is a mobile dispatcher, or DTMF tones, if it is a fixed line dispatcher.

If the call is terminated by a mobile dispatcher using DTMF, the out-of-band messages START_DTMF(X) and STOP_DTMF are sent via the radio interface towards the network. If the out-of-band DTMF messages are sent by a mobile dispatcher who is not controlled by the anchor MSC, the DTMF messages will be converted by the controlling MSC (e.g. relay MSC or visited MSC) into DTMF tones and these DTMF tones will be sent through the network to the anchor MSC.

If a fixed dispatcher initiates DTMF tones, the DTMF tones will be sent through the network to the anchor MSC.

Both in case of a mobile and a fixed line dispatcher the anchor MSC is responsible for the detection and collection of the out-of-band or inband DTMF signals. After the evaluation of the DTMF signals, the anchor MSC has to trigger the appropriate function (see the figures 7b to 7d in 11.3.8).

In order to avoid the erroneous detection of the specific DTMF tone sequence for call termination by the MSC, this sequence shall consist of at least three DTMF digits.

11.3.3 Leaving of a dispatcher

A dispatcher can disconnect from the call at any time without terminating the call. In order to terminate the call a dispatcher who is entitled to do this must use the explicit signalling described in subclause 11.3.2.1~~ (e.g. DTMF)~~.

~~NOTE: This signalling is currently not specified in the GSM technical specifications and left for operator specific solutions.~~

* * * * * * * * * * * * * NEXT MODIFICATION * * * * * * * * * * * * * * * * *

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice broadcast call message structure proposed and actions required is given in figures 2 to 4~~a~~d.

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:**CONNECT:** Information to the mobile station of the calling subscriber that the VBS is established with the related broadcast call reference as the connected number.

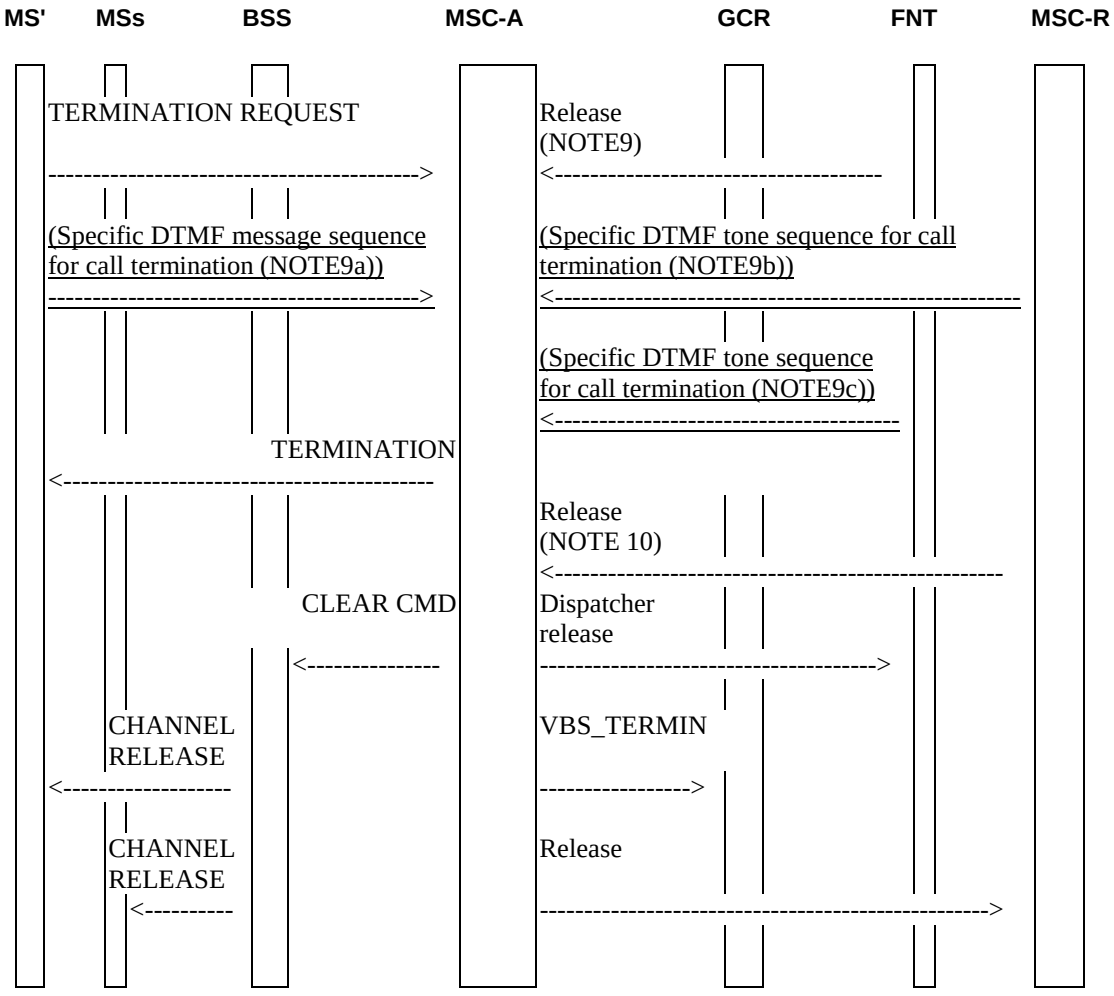

Figure 4: Signalling required to disconnect the voice broadcast call

TERMINATION REQUEST: The calling subscriber's mobile station can send a TERMINATION REQUEST message to clear down the entire voice broadcast call.

NOTE 9: Alternatively an authorized dispatcher can terminate the voice broadcast call in which case a release message is received from the external network.

NOTE 9a: Alternatively an authorized mobile dispatcher can terminate the voice broadcast call by using a specific DTMF message sequence. If the mobile dispatcher is controlled by the anchor MSC, the specific DTMF message sequence is received by the anchor MSC (see Figure 7b).

NOTE 9b: If the mobile dispatcher is controlled by a relay MSC, the specific DTMF message sequence is received by the relay MSC. The relay MSC converts the DTMF messages into DTMF tones and sends them towards the anchor MSC (see Figure 7c).

NOTE 9c: Alternatively an authorized fixed line dispatcher can terminate the voice broadcast call by using a specific DTMF tone sequence. In this case, the specific DTMF tone sequence is received by the anchor MSC (see Figures 7d).

NOTE 10: Alternatively the calling subscriber currently served by the relay-MSC can terminate the call in which case a release message is received from the relay MSC on the dedicated connection.

CLEAR CMD: This message is sent from the MSC to all related BSC to disconnect calls from the distribution function and stop all periodic notifications for the voice broadcast call to be released.

VBS_TERMIN: The MSC informs the GCR that the voice broadcast call with the related broadcast call reference is terminated.

CHANNEL RELEASE: CHANNEL RELEASE messages are sent to the calling subscriber and on all downlink FACCH to the service subscribers. The **CHANNEL** RELEASE messages shall be repeated for a predefined period in order to provide a high probability that the listening mobile stations receive the message.

- CHANNEL RELEASE message is sent using I frame for the calling subscriber.
- CHANNEL RELEASE messages are sent using UI frames for listeners.

In addition, release messages are sent to all related dispatchers and relay MSCs.

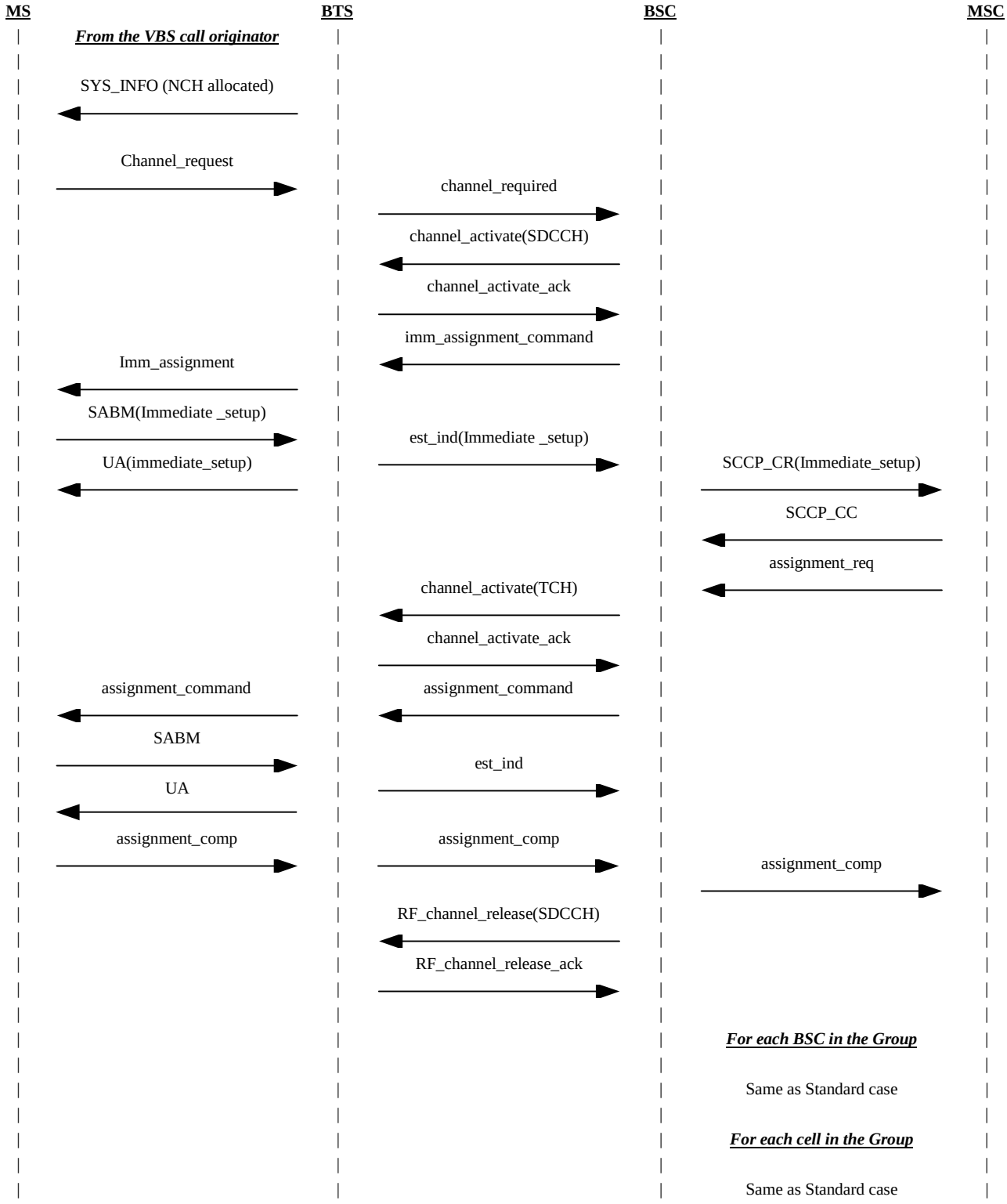

Figure 4a: Signalling information required for establishing voice broadcast calls by a service subscriber using immediate setup

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASSIGNMENT: Standard message send on the PAGCH.

IMMEDIATE_SETUP: This message including all details of the broadcast call is sent by the MS to the network in order to set-up a broadcast call immediately, i.e. without previous establishment of an MM connection.

UA (IMMEDIATE_SETUP): This message is used to acknowledge the layer 2 link and provide contention resolution of the immediate setup.

NOTE 11: Authentication and/ or activation of Ciphering may be performed before or after sending a CONNECT message. If ciphering has not been activated before sending a CONNECT message, a CM_SERVICE ACCEPT may be sent before the CONNECT message by the MSC, however sending of the CM_SERVICE_ACCEPT is not mandatory.

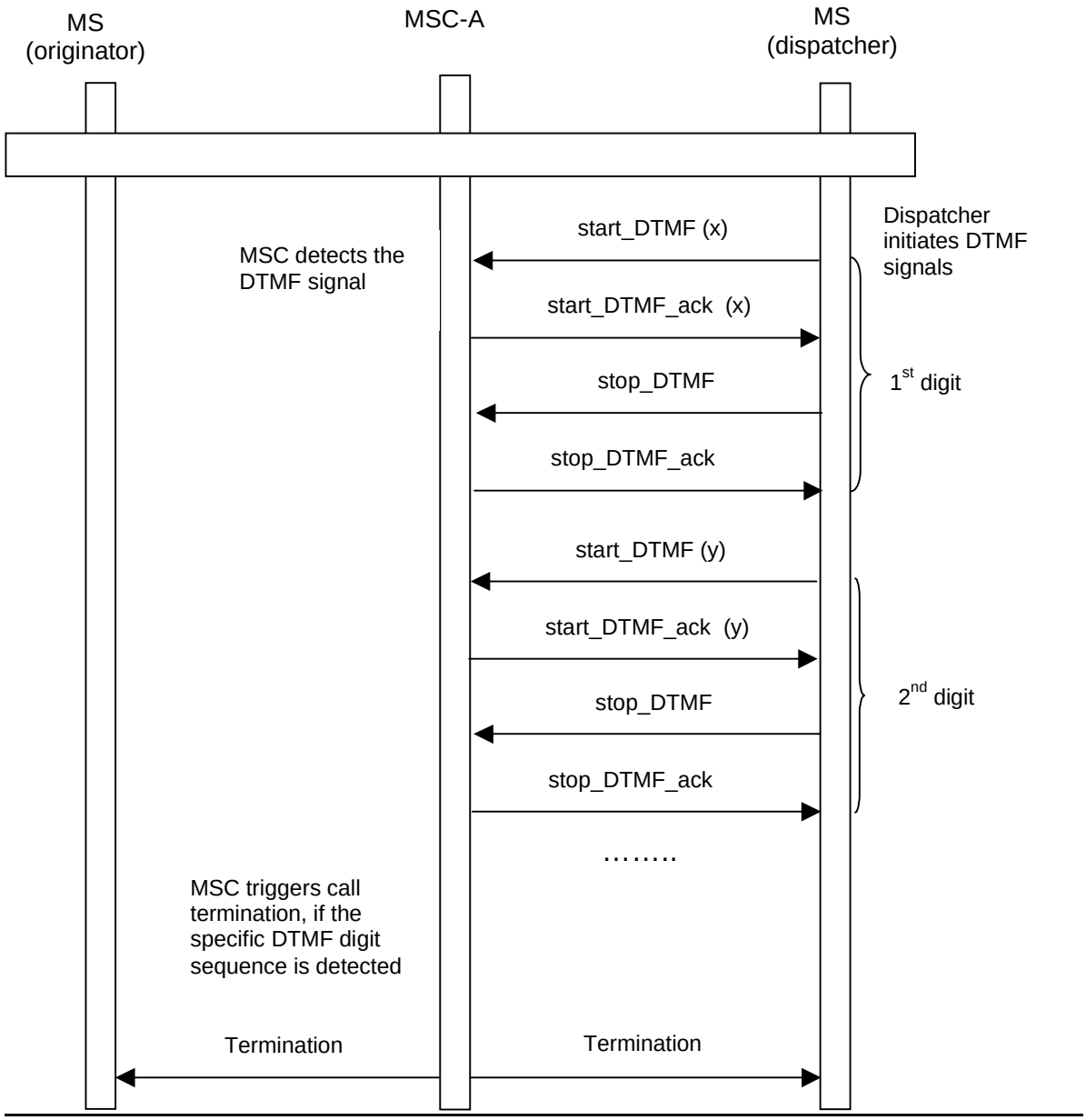

Figure 7b: Signalling required for broadcast call termination by an entitled mobile dispatcher, if the mobile dispatcher is controlled by the anchor MSC of the broadcast call.

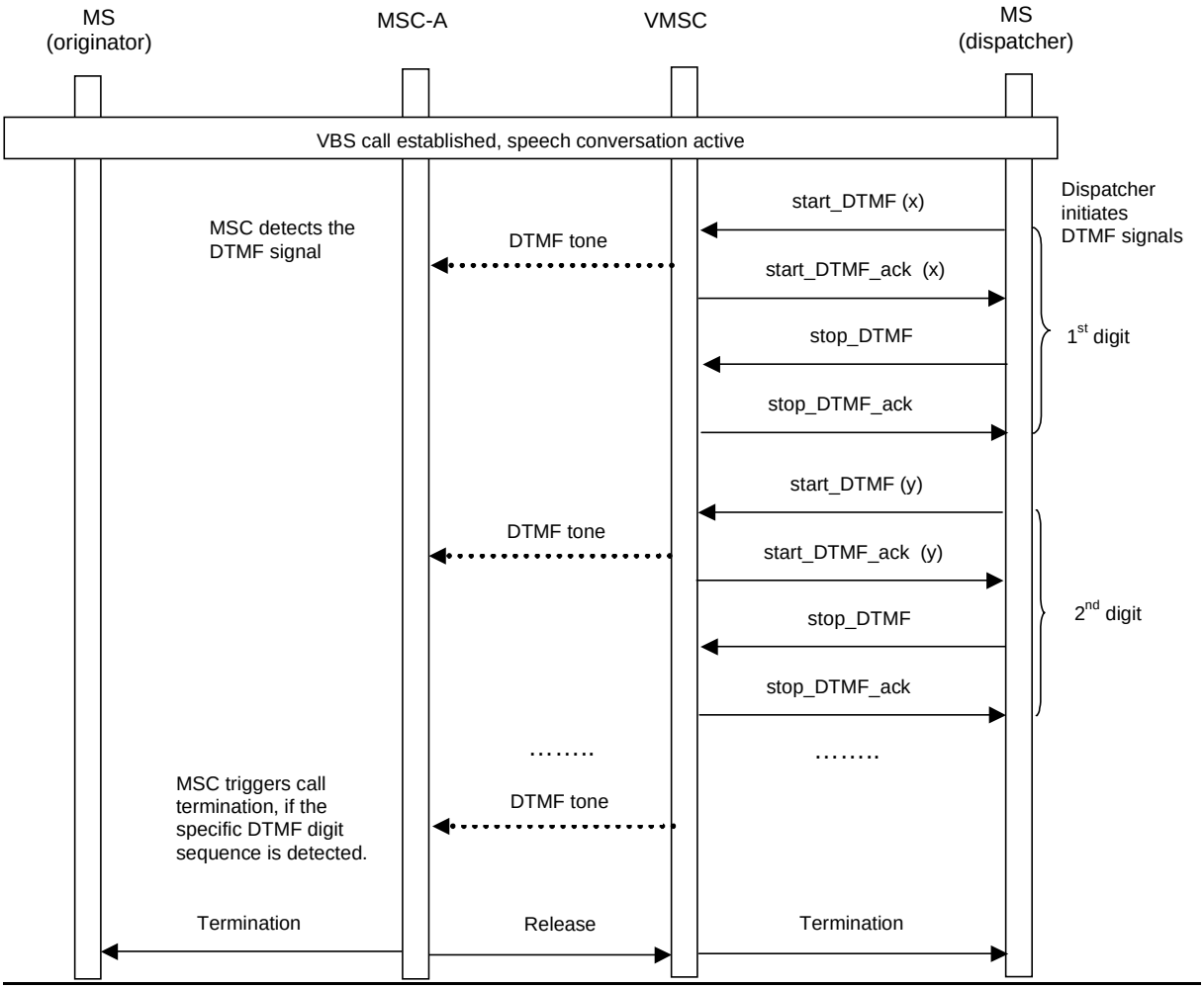

Figure 7c: Signalling required for broadcast call termination by an entitled mobile dispatcher, if the mobile dispatcher is controlled by a visited MSC (could be a relay MSC) of the group call.

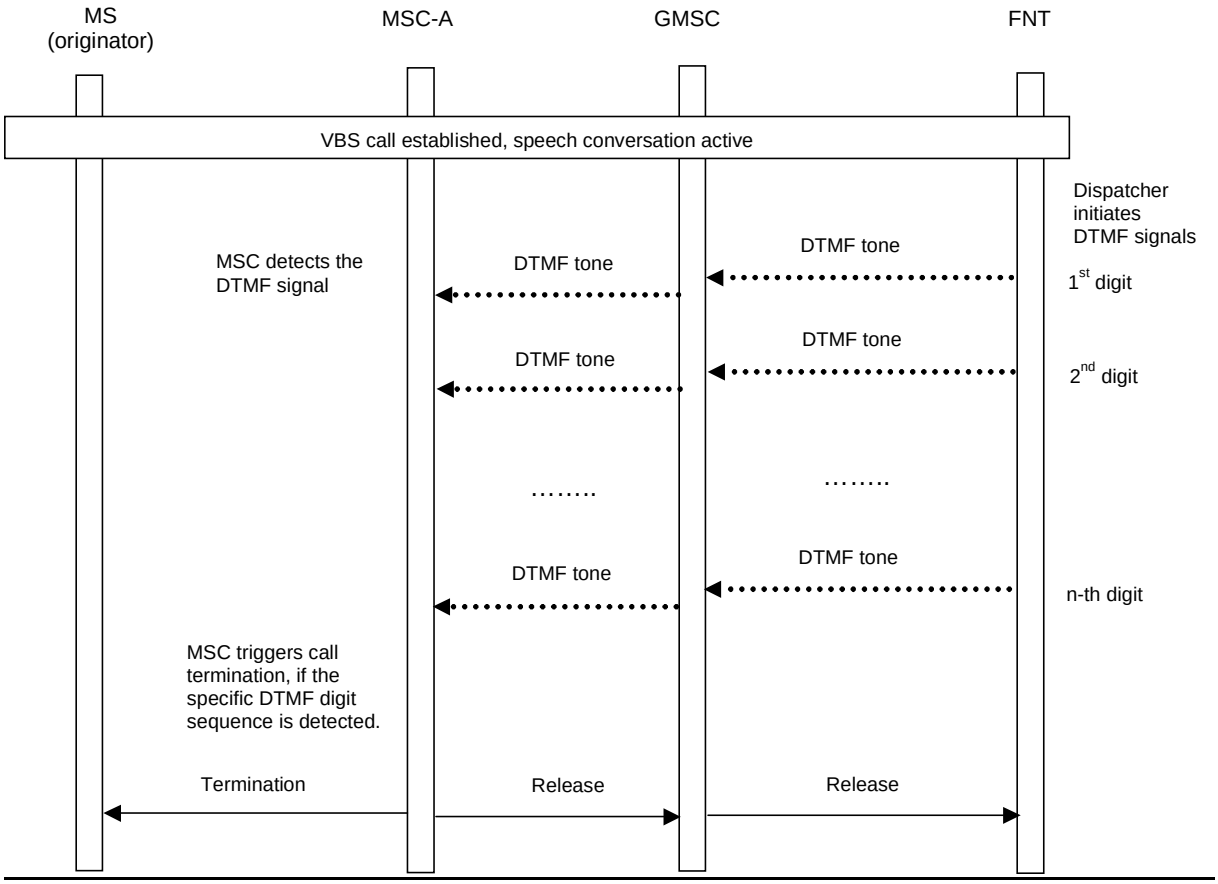

Figure 7d: Signalling required for broadcast call termination by an entitled fixed line dispatcher

* * * * * * * * * * * * * NEXT MODIFICATION * * * * * * * * * * * * * * * * *

11.4 Functional requirement of Anchor-MSC

The VBS handling process in the anchor MSC is shown in figure 5.

Successful call set-up

When the VBS handling process in the anchor MSC receives a VBS call set-up request from either a dispatcher or a service subscriber currently located in the anchor MSC's area or a service subscriber currently located in a relay MSC's area, it interrogates its associated GCR to retrieve the broadcast call attributes, and waits for a response.

If the GCR returns a positive response containing the broadcast call attributes, the anchor MSC sets up the downlinks to the cells inside the MSC area of the group call anchor MSC into which the call is to be sent, sets up the connections to the dispatchers to which a dedicated link is to be established , sets up the connections to the relay MSCs into which the call is to be sent and waits for call release.

Procedure Setup Connections to Relay MSCs

The procedure is shown in figure 6.

The procedure sends PREPARE_GROUP_CALL messages to all relay MSCs and waits for the responses.

If a positive response containing an Group Call number is received from a relay MSC, the anchor MSC constructs an IAM using the Group Call number as called party address, sends it to the relay MSC and waits for the SEND_GROUP_CALL_END_SIGNAL message.

If the SEND_GROUP_CALL_END_SIGNAL message is received, the procedure returns an acknowledgement to the relay MSC and checks whether responses from other relay MSCs are outstanding. Relay MSCs that do not send positive responses on the PREPARE_GROUP_CALL message are no longer considered to belong to the list of relay MSCs for this VBS call.

Negative response received from the GCR

If the GCR returns a negative response to the anchor MSC indicating that the call is already on-going, the anchor MSC checks whether the call was initiated by a dispatcher. If so, the dispatcher is connected to the on-going call and the process returns to the idle state. If the call was initiated by a service subscriber, a Release message indicating 'user busy' is returned in order to force the mobile station of the service subscriber to look for notifications of the respective group ID on the NCH and join the broadcast call.

If the negative response from the GCR indicates any other reason than 'on-going call' the VBS call set-up request is rejected by sending a release message back to the initiator and the process returns to the idle state.

Call release

~~When receiving a release~~ If the anchor MSC receives the specific DTMF message sequence or the specific DTMF tone sequence for call termination ~~either~~ from a dispatcher who is allowed to terminate the voice broadcast call (see Figures 7b to 7d), or a Termination Request message from the service subscriber who has initiated the VBS call ~~in the anchor MSC area or in a relay MSC area~~, the connections to the relay MSCs are released, all connections to dispatchers are released, all downlinks to cells inside the anchor MSC area are released, the GCR is informed that the call is no longer on-going and the process returns to the idle state.

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021789***
Helsinki, Finland, 29 July – 2 August *Tdoc N1-021535*

CR-Form-v7

CHANGE REQUEST

⌘ **23.009** **CR** **080** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Support for Shared Network Area
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	2002-07-30
Category:	⌘	**B**
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)*

Reason for change:	⌘	RAN WG3 #30 agreed on a final solution for the support of Shared Networks in connected mode in Release 5. Please see LS N1-021535 and the TR R3:012 included. The agreed solution is based on the concept of SNA which is basically a collection of Location Areas. A set of allowed SNAs is associated to each IMSI serie. The set of allowed SNAs, the Shared Network Area (SNA) information is signalled to the radio access network at the call set up to allow the radio access network decide which Location Area the subscriber may be handed over to at a later point.
Summary of change:	⌘	SNA information resides in the CN and is transferred to the radio access network via the Iu interface where it is used for selection of the target cell for handover. During the inter-MSC handover, the SNA information is sent from the anchor to the non-anchor and passed to the radio access network by the non-anchor. For emergency calls, SNA information does not apply. This CR specifies handling of the SNA information with respect to the handover/relocation.
Consequences if not approved:	⌘	Correct target for handover could not be selected for Shared Networks.

Clauses affected:	⌘	3.1, 4.3.1, 4.4.1

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	22.129, 25.413, 25.401, 25.423, 29.002, 23.003, 29.010
				Test specifications		

	☐☐ O&M Specifications	
Other comments:	⌘	This CR was once presented at CN1#24 (N1-021430) for conditional approval. Since RAN WG3 could not reach to an agreement by the end of the CN1 meeting, the CR was withdrawn. In this revision the terminology is aligned with those used in other specifications, i.e. “SNA” is used instead of “access rights”. Reference to TS 25.401 where SNA is briefly described is also added.

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 MODIFICATION **********

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] ITU-T Recommendation Q.118: "Abnormal conditions - Special release arrangements".

[2] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2a] 3GPP TS 21.905: "3G Vocabulary".

[3] 3GPP TS 03.68: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS); Stage 2".

[4] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio Subsystem Link Control".

[5] 3GPP TS 48.008: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC-BSS) Interface Layer 3 specification".

[6] 3GPP TS 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controler - Base Transceiver Station (BSC-BTS) Interface Layer 3 specification".

[7] 3GPP TS 09.08: "Digital cellular telecommunications system (Phase 2+); Application of the Base Station System Application Part (BSSAP) on the E-interface".

[8] 3GPP TS 29.010: "Information Element Mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS-MSC); Signalling procedures and the Mobile Application Part (MAP)".

[9] 3GPP TS 22.129: "Handover Requirements between UMTS and GSM or other Radio Systems".

[10] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[11] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[12] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[13] 3GPP TS 25.303: "UE functions and inter-layer procedures in connected mode".

[14] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[15] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

[16] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[17] 3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes".

[19] 3GPP TS 23.221: "Architectural Requirements".

[20] 3GPP TS 25.401: "UTRAN Overall Description".

********** NEXT MODIFICATION **********

3.1 Abbreviations

For the purpose of the present document, the following abbreviations apply:

3G_MSC	A third generation MSC that supports the Iu interface and optionally the A interface
3G_MSC-A	The controlling 3G_MSC on which the call was originally established
3G_MSC-B	The 3G_MSC to which the UE is handed over in a Basic Handover
3G_MSC-B'	The 3G_MSC to which the UE is handed over in a Subsequent Handover
BSC	Base Station Controller
BSS	Base Station System
BSS-A	The BSS from which the MS is being handed over
BSS-B	The BSS to which the MS is being handed over
BTS	Base Transceiver Station
GERAN	GSM EDGE Radio Access Network
ISC	International Switching Centre
MS	Mobile Station
MSC	A second generation Mobile Services Switching Centre that only supports the A interface
MSC-A	The controlling MSC on which the call was originally established
MSC-B	The MSC to which the MS is handed over in a Basic Handover
MSC-B'	The MSC to which the MS is handed over in a Subsequent Handover
RNC	Radio Network Controller
RNS	Radio Network Subsystem
SBSS	Serving BSS
SNA	Shared Network Area
SRNS	Serving RNS
UE	A User Equipment is a terminal that supports USIM and the UMTS Uu interface
UE/MS	A terminal that supports USIM, SIM, the Uu interface and the Um interface
USIM	UMTS Subscriber Identity Module

Other abbreviations used in the GSM specifications are listed in 3GPP TS 01.04 [2] and 3GPP TS 21.905[2a].

********** NEXT MODIFICATION **********

4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP or BSSMAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In a network implementing the "Flexible Iu interface for handover/relocation" option, 3G_MSC-A may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-A can have multiple target CN nodes for each handover/relocation target in a pool-area as specified in 3GPP TS 23.236 [18].

In the case of intra-MSC handover of a speech call, 3G_MSC-A controls the transcoder in the core network. The 3G_MSC-A determines if a transcoder is required to be inserted or released in the CN.

In the case of Inter-3G_MSC relocation, 3G_MSC-A links out the transcoder.

In the Inter-3G_MSC relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE during the call, before, during and after a basic or subsequent relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - RNS interface for the RANAP procedures. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE.

During a successful relocation the order to perform location reporting at change of Service Area is not transferred to the target RNS. In the Intra-3G_MSC-A relocation case, the 3G_MSC-A re-issues the Location Reporting Control towards the target RNS. In the Inter-3G_MSC relocation case, 3G_MSC-A keeps the control of the Location Report Control procedure. However, re-issuing the Iu-LOCATION-REPORTING-CONTROL messages due to subsequent Intra-3G_MSC-B relocations is the responsibility of 3G_MSC-B.

During a basic relocation, 3G_MSC-A initiates and controls all the relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation Cancel from RNS-A).

During a subsequent relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic relocation paragraph and towards 3G_MSC-B as described above in subsequent relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in 3GPP TS 09 08 [7] are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system UMTS to GSM handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system UMTS to GSM handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation Cancel from RNS-A).

During a subsequent inter-system UMTS to GSM handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

During a basic inter-system GSM to UMTS handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system GSM to UMTS handover back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Handover Failure from BSS-A).

During a subsequent inter-system GSM to UMTS handover to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards MSC-B as described above in subsequent inter-system handover paragraph.

3G_MSC-A may assign a priority level defined as RAB parameter in 3GPP TS 25.413 [11] for each bearer. In case of relocation of a multicall configuration the 3G_MSC-B or the target RNC shall select the bearers to be handed over according to the priority level, if the target cell is not able to accommodate all bearers. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) 3G MSC-A shall send the SNA information to 3G_MSC-B except for emergency calls.

If 3G_MSC-A supports the optional supplementary service Multicall (See 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the Intra-3G_MSC relocation case, the 3G-MSC-A tries to relocate all bearers to a new RNS.
- In the basic relocation case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B. If 3G_MSC-A receives an indication that the 3G_MSC-B does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the subsequent relocation to a third 3G_MSC-B' case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B'. If 3G_MSC-A receives an indication that the 3G_MSC-B' does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the basic inter-system UMTS to GSM handover case, the 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.
- In all cases described above, 3G_MSC-A shall release some calls which has been carried by the bearers failed to set up in new RNS or the bearers not to be handed over.

********** NEXT MODIFICATION **********

4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure. 3G_MSC-B notifies MSC-A or 3G_MSC-A of intra-3G_MSC-B InterSystem handover and intra GSM handovers, by using the A-HANDOVER-PERFORMED message.

In case of intra-3G_MSC-B SRNS relocation, if security algorithms have been changed:

a) When encapsulated BSSAP is used on the E interface, the A-HANDOVER-PERFORMED message shall be sent.

b) When encapsulated RANAP is used on the E interface, the Iu-LOCATION-REPORT message shall be sent.

On reception of an order to perform location reporting at change of Service Area from 3G_MSC-A, 3G_MSC-B shall be responsible to re-issue the Iu-LOCATION-REPORTING-CONTROL message after subsequent Intra-3G_MSC-B relocations/handovers. This shall be performed immediately after the successful completion of the Relocation Resource Allocation procedure.

In both cases, the selected UMTS algorithm(s) shall be indicated in the MAP-PROCESS-ACCESS-SIGNALLING request.

In a network implementing the "Flexible Iu interface for handover/relocation" option, in the Intra-3G_MSC handover/relocation case, 3G_MSC-B may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For subsequent inter-MSC handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-B can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

The role of 3G_MSC-B is also to provide transcoder resources.

In the Inter-3G_MSC relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the BSSMAP information received on the A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its BSSs to the extent that 3G_MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between 3G_MSC-B and BSS-B is under the responsibility of 3G_MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

At intra-PLMN handover/relocation, 3G_MSC-B shall send Service Handover related information to the BSC/RNC if and only if this Service Handover information is received from 3G_MSC-A. 3G_MSC-B shall not modify Service Handover related information received from a 3G_MSC-A within the same PLMN.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) when SNA information is received by 3G_MSC-B from 3G_MSC-A, 3G MSC-B shall send the SNA information to the RNS.

If 3G_MSC-B does not support the optional supplementary service Mutlicall (see 3GPP TS 23.135) and 3G_MSC-A requests to relocate multiple bearers, 3G_MSC-B shall indicate that it does not support multiple bearers to 3G_MSC-A.

If 3G_MSC-B supports the optional supplementary service Multicall (see 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the basic relocation case, the 3G_MSC-B shall be able to allocate a Handover Number for each bearer. The 3G_MSC-B shall also be able to select some bearers to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] so that the number of bearers will fulfill the maximum number of bearers supported by the 3G_MSC-B. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

- In the Intra-3G_MSC relocation case, the 3G_MSC-B tries to relocate all bearers to a new RNS.

- In the subsequent relocation back to the 3G_MSC-A or to a third 3G_MSC-B' case, the 3G_MSC-B tries to request to the 3G_MSC-A to relocate all bearers to the 3G_MSC-A or to the 3G_MSC-B'.

- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the subsequent inter-system UMTS to GSM handover back to the 3G_MSC-A or to a third MSC-B' case, the 3G_MSC-B shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.

3GPP TSG-CN1 Meeting #25

Helsinki, Finland, 29 July – 2 August

Tdoc N1-021809
revised N1-021642

CR-Form-v7

CHANGE REQUEST

⌘ **23.122** **CR** **052** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Applicability of the lists of “forbidden LAs"
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	30.07.2002
Category:	⌘	**F**
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)*

Reason for change:	⌘	With the 23.122 CR 026r1 the term " lists “forbidden LAs" " was changed by explicitly listing both the #12 and the #13 list. Unfortually there were two mistakes made, where only the list of "forbidden LAs for regional provision of service" is stated, whereas the list of "forbidden LAs for roaming" is missing.
Summary of change:	⌘	The missing list "forbidden LAs for roaming" is added to the conditions when a LR is not allowed to be performed by the MS defined in sections 4.4.3.1.1 and 5.
Consequences if not approved:	⌘	There is the risk that a MS implementation only check the list of "forbidden LAs for regional provision of service", but not the list of "forbidden LAs for roaming" before starting a LR request and in consequence will never stop performing new LR requests in a LA which is contained in the list of "forbidden LAs for roaming".

Clauses affected:	⌘	4.4.3.1.1; 5

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

Other comments:	⌘	

4.4.3.1.1 Automatic Network Selection Mode Procedure

The MS selects and attempts registration on other PLMNs, if available and allowable, in the following order:

i) HPLMN (if not previously selected);

ii) each PLMN in the "User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iii) each PLMN in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iv) other PLMN/access technology combinations with received high quality signal in random order;

v) other PLMN/access technology combinations in order of decreasing signal quality.

When following the above procedure the following requirements apply:

a) In A/Gb mode or GSM COMPACT, an MS with voice capability shall ignore PLMNs for which the MS has identified at least one cell that do not offer voice service. (In A/Gb mode, this is indicated by the CELL_BAR_QUALIFY_2 parameter).

b) In A/Gb mode or GSM COMPACT, an MS with voice capability, or an MS not supporting packet services shall not search for CPBCCH carriers.

c) In ii and iii, the MS should limit its search for the PLMN to the access technology or access technologies associated with the PLMN in the appropriate PLMN Selector with Access Technology list (User Controlled or Operator Controlled selector list). An MS using a SIM without access technology information storage (i.e. the "User Controlled PLMN Selector with Access Technology" and the "Operator Controlled PLMN Selector with Access Technology" data fields are not present) shall instead use the "PLMN Selector" data field, for each PLMN in the "PLMN Selector" data field, the MS shall search for all access technologies it is capable of and shall assume GSM access technology as the highest priority radio access technology.

d) In iv and v, the MS shall search for all access technologies it is capable of, before deciding which PLMN to select.

e) In ii, and iii, a packet only MS which supports GSM COMPACT, but using a SIM without access technology information storage (i.e. the "User Controlled PLMN Selector with Access Technology" and the "Operator Controlled PLMN Selector with Access Technology" data fields are not present) shall instead use the "PLMN Selector" data field, for each PLMN in the "PLMN Selector" data field, the MS shall search for all access technologies it is capable of and shall assume GSM COMPACT access technology as the lowest priority radio access technology.

f) In i, the MS shall search for all access technologies it is capable of. The MS shall start its search using the access technologies stored in the "HPLMN Selector with Access Technology" data field on the SIM in priority order as defined in clause 4.4.3 (i.e. the PLMN/access technology combinations are listed in priority order, if an entry includes more than one access technology then no priority is defined for the preferred access technology and the priority is an implementation issue).

g) In i, an MS using a SIM without access technology information storage (i.e. the "HPLMN Selector with Access Technology" data field is not present) shall search for all access technologies it is capable of and shall assume GSM access technology as the highest priority radio access technology. A packet only MS which supports GSM COMPACT using a SIM without access technology information storage shall also assume GSM COMPACT access technology as the lowest priority radio access technology.

h) In v, the MS shall order the PLMN/access technology combinations in order of decreasing signal quality within each access technology. The order between PLMN/access technology combinations with different access technologies is an MS implementation issue.

NOTE 1: Requirements a) and b) apply also to requirement d), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if capable of GSM COMPACT.

NOTE 2: Requirements a) and b) apply also to requirement f), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if this is the only access technology on the "HPLMN Selector with Access Technology" data field on the SIM. Also PLMNs not offering voice services should be ignored by voice capable GSM mobiles.

NOTE 3: High quality signal is defined in the appropriate AS specification.

If successful registration is achieved, the MS indicates the selected PLMN.

If registration cannot be achieved because no PLMNs are available and allowable, the MS indicates "no service" to the user, waits until a new PLMN is available and allowable and then repeats the procedure.

If there were one or more PLMNs which were available and allowable, but an LR failure made registration on those PLMNs unsuccessful or an entry in any of the lists "forbidden LAs for roaming", or ~~in the~~ "forbidden LAs for regional provision of service" ~~list~~ prevented a registration attempt, the MS selects the first such PLMN again and enters a limited service state.

4.5.2 Initiation of Location Registration

An LR request indicating Normal Updating is made when, in idle mode,

- the MS changes cell while being in the update state NOT UPDATED; (for MS capable of GPRS and non-GPRS services when at least one of both update states is NOT UPDATED)
- the MS detects that it has entered a new registration area, i.e., when the received registration area identity differs from the one stored in the MS, and the LAI or the PLMN identity is not contained in any of the lists of "forbidden LAs for roaming", "forbidden LAs for regional provision of service", "forbidden PLMNs for GPRS service" or "forbidden PLMNs" respectively, while being in one of the following update states:
  - UPDATED;
  - NOT UPDATED;
  - ROAMING NOT ALLOWED.
- the Periodic Location Updating Timer expires while being in the non-GPRS update state NOT UPDATED (triggers Location Updating);
- the Periodic Routing Area Update timer expires while being in the GPRS update state NOT UPDATED (triggers Routing Area Update);
- a manual network reselection has been performed, an acceptable cell of the selected PLMN is present, and the MS is not in the UPDATED state on the selected PLMN.

An LR request indicating Periodic Location Updating is made when, in idle mode, the Periodic Location Updating timer expires while being in the non-GPRS update state UPDATED.

An LR request indicating Periodic Routing Area Update is made when the Periodic Routing Area Update timer expires while being in the GPRS update state UPDATED.

An LR request indicating IMSI attach is made when the MS is activated in the same location area in which it was deactivated while being in the non-GPRS update state UPDATED, and the system information indicates that IMSI attach/detach shall be used.

A GPRS attach is made by a GPRS MS when activated and capable of services which require registration. A GPRS attach may only performed if the selected PLMN is not contained in the list of "forbidden PLMNs for GPRS service". Depending on system information about GPRS network operation mode MSs operating in MS operation mode A or B perform combined or non-combined location registration procedures. When the combined routing area update or GPRS attach is accepted with indication "MSC not reachable" or is not answered the MS performs also the corresponding location updating procedure or falls back to a GPRS only MS. When the combined routing area update or GPRS attach is rejected with cause "GPRS not allowed" the GPRS update state is "IDLE, NO IMSI" and the MS performs the corresponding location updating procedure.

Furthermore, an LR request indicating Normal Location Updating is also made when the response to an outgoing request shows that the MS is unknown in the VLR or SGSN, respectively.

Table 2 in clause 5 summarizes the events in each state that trigger a new LR request. The actions that may be taken while being in the various states are also outlined in table 2.

A GPRS MS which is both IMSI attached for GPRS and non-GPRS services and which is capable of simultaneous operation of GPRS and non-GPRS services shall perform Routing Area Update in connected mode when it has entered a new routing area which is not part of a LA contained in the list of "forbidden LAs for roaming" or "forbidden LAs for regional provision of service".

5 Tables and Figures

Table 1: Effect of LR Outcomes on PLMN Registration

Location Registration Task State	Registration Status	Registered PLMN is
Updated	Successful	Indicated in the stored registration area identity
Idle, No IMSI	Unsuccessful	No registered PLMN (3) (4)
Roaming not allowed:		
a) PLMN not allowed	Unsuccessful	No registered PLMN (4)
b) LA not allowed	Indeterminate(1)	No registered PLMN (4)
c) Roaming not allowed in this LA	Indeterminate (2)	No registered PLMN (4)
d) No Suitable Cells In Location Area	Indeterminate (5)	No registered PLMN (4)
Not updated	Unsuccessful	No registered PLMN (4)

1) The MS will eventually either enter a different state when the registration status will be determined, or fail to be able to camp on a cell, when registration will be unsuccessful.
2) The MS will select the HPLMN if in automatic mode and will enter Automatic Network Selection Mode Procedure of clause 4.4.3.1. If in manual mode, the MS will display the list of available PLMNs and follow the Manual Network Selection Mode Procedure of clause 4.4.3.1.2 If the appropriate process does not result in registration, the MS will eventually enter the limited service state.
3) A MS may have different update states for GPRS and non-GPRS. A PLMN is registered when at least one of both update states is updated.
4) If there is no registered PLMN, the stored list of equivalent PLMNs is invalid.
5) The MS will attempt registration on another LA of the same PLMN if one is available otherwise it will enter either the Automatic Network Selection Mode procedure of clause 4.4.3.1 or follow the Manual Network Selection Mode procedure of clause 4.4.3.1.2. If the appropriate process does not result in registration, the MS will eventually enter the limited service state.

NOTE 1: MSs capable of GPRS and non-GPRS services may have different registration status for GPRS and for non-GPRS.
NOTE 2: The registered PLMN is determined by looking at the stored registration area identity and stored location registration status.

Table 2: LR Process States and Allowed Actions

Location registration task state	New LR request when				Normal Calls Supported (1)	Paging responded to
	Changing Cell	Changing registration area	Changing PLMN	Other		
Null (4)	No	Yes	Yes	No	No	No
Updated, (5)	No	Yes	Yes	(2)	Yes	Yes
Idle, No IMSI (7)	No	No	No	No	No	No
Roaming not allowed:						
a) Idle, PLMN not allowed	No	No	Yes	No	No	Optional if with IMSI
b) Idle, LA not allowed	No	Yes(6)	Yes	No	No	Optional if with IMSI
c) Idle, Roaming not allowed in this LA	No	Yes(6)	Yes	No	No	Optional if with IMSI
d) No Suitable Cells In Location Area	No	Yes(6)	Yes	No	No	Optional if with IMSI
Not updated	Yes	Yes	Yes	(2)&(3)	(3)	Yes if with IMSI

1): Emergency calls may always be made, subject to access control permitting it.
2): A new LR is made when the periodic registration timer expires.
3): If a normal call request is made, an LR request is made. If successful the updated state is entered and the call may be made.
4): The MS is in the null state from switch on until it has camped on a cell and either made an LR attempt or decided that no LR attempt is needed.
5): In this state, IMSI detach is performed if the MS is deactivated and the BCCH indicates that IMSI attach/detach shall be used. An LR request indicating IMSI attach is performed if the MS is activated in the same registration area in which it was deactivated while being in this state.
6): A ~~GPRS~~ MS shall not perform a new LR when the new routing area is part of a LA contained in any of the lists “forbidden LAs for roaming”, or ~~in the list of~~ "forbidden LAs for regional provision of service”.
7): The GPRS registration status "Idle, no IMSI“ is entered when LR is rejected with cause "GPRS not allowed“. The non-GPRS registration status „Idle, no IMSI“ is entered when the cause "IMSI unknown in HLR“ is received.

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021836
(rev of Tdoc N1-021806)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **057** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*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 ☐

Title:	⌘	Clarification of the CN release indicators
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	30.07.2002
Category:	⌘	**F**
Release:	⌘	REL-5

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R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	With the LS on "Terminal determination of support of EGPRS in the network" (N1-021526)TSG CN1 was requested by TSG GERAN to clarify the definitions of MSCR (MSC Release) and SGSNR (SGSN Release) in the core network specifications.
Summary of change:	⌘	It is proposed to explicitly state that the MSCR and SGSNR are indicating the release supported by the core network.
Consequences if not approved:	⌘	Risk of ambiguities how the release supported by the core network can be determined by the MS.

Clauses affected:	⌘	11.2.3.2.3.1.1

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

Other comments:	⌘	

11.2.3.2.3.1.1 Send state variable V(SD)

The mobile station shall have one associated send state variable V(SD) ("Send Duplicated") for each upper layer message flow. The send state variable denotes the sequence number of the next in sequence numbered message in the flow to be transmitted. The value of the corresponding send state variable shall be incremented by one with each numbered message transmission.

For the MM+CC+SS upper layer message flow, when the RR connection starts with a core network of release 98 or earlier, arithmetic operations on V(SD) are performed modulo 2. When the RR connection starts with a core network of Release 99 or later, arithmetic operations on V(SD) are performed modulo 4. The mobile station shall keep using the same modulo (2 or 4) for the duration of the RR connection.

For the GCC, BCC, and LCS upper layer message flows, arithmetic operations on V(SD) are performed modulo 2.

NOTE: In GSM, the release supported by the core network is indicated in the MSCR bit and in the SGSNR bit in the ~~broadcast as~~ system information broadcast (see 3GPP TS 44.018 [6b] and 3GPP TS 44.060 [10a]).