Technical Specification Group Services and System Aspects **TSGS#14(01)0707**

Meeting #14, Kyoto, Japan, 17-20 December 2001

Source: **TSG SA WG2**
Title: **CRs on LCS at SA2 (03.71, 23.171, 23.271)**
Agenda Item: **7.2.3**

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #14.
Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

- CRs applicable to 03.71 v.7.7.0 and v.8.3.0

Tdoc #	**Title**	**Spec**	**CR #**	**cat**	**Rel**	**WI**
S2-013253	Error Handling for E-OTD and GPS	03.71	A033	F	R98	LCS
S2-013254	Error Handling for E-OTD and GPS	03.71	A034	A	R99	LCS

- CRs applicable to 23.171 (v.3.5.0)

S2-012768	Wrong node name in privacy check procedures	23.171	020	F	R99	LCS
S2-013006	Exception procedures in the VMSC	23.171	021	F	R99	LCS

- CRs applicable to 23.271 Rel-4 (v.4.3.0) and Rel-5 (v.5.0.0)

Tdoc #	**Title**	**Spec**	**CR #**	**cat**	**Rel**	**WI**
S2-013403	Correction of refererred signaling step in MO-Location Request	23.271	050	F	Rel-4	LCS1
S2-013562	Correction of referred signaling step in MO-Location Request	23.271	051r1	A	Rel-5	LCS1
S2-013359	Removal of PDP address from HLR/HSS in the MT-LR procedure	23.271	041	F	Rel-4	LCS
S2-013534	Removal of PDP address from HLR/HSS in the MT-LR procedure	23.271	042r1	A	Rel-5	LCS1
S2-013389	Response to LCS client in case of deferred MT-LR	23.271	043	F	Rel-4	LCS1
S2-013390	Response to LCS client in case of deferred MT-LR	23.271	044	A	Rel-5	LCS1
S2-013450	Editorial correction to front page	23.271	055	D	Rel-5	LCS1
S2-013561	SGSN Exception procedures	23.271	049R1	F	Rel-5	LCS1
S2-012804	Clarification on the interworking issue with Pre-REL4 LCS PS Domain	23.271	036	F	Rel-4	LCS1
S2-013013	LCS Capability Handling for GPRS MS's	23.271	038r1	B	Rel-5	LCS

3GPP TSG-SA2#21 Meeting
Cancun, Mexico, Nov 26-30 2001

S2-013253

CR-Form-v4

CHANGE REQUEST

⌘ **03.71** **CR** **A033** ⌘ ev **-** ⌘ Current version: **7.7.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Error handling for E-OTD and GPS
Source:	⌘	SIEMENS
Work item code:	⌘	LCS
Date:	⌘	Nov 26th 2001
Category:	⌘	**F**
Release:	⌘	R98

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)

Reason for change:	⌘	7.11.4.4: In according to case 3 of section 10.6, when an ongoing intra BSC HO has timed out, the BSC shall terminate any network or MS positioning or transfer of assistance data procedure sending to SMLC either a BSSLAP Reset or a BSSLAP Abort message. 10.6: When the SMLC sends a RRLP request to BSC involved into on ongoing inter-BSC HO, SMLC has not knowledge about the ongoing inter-handover until it receives a BSSLAP Abort from the BSC.
Summary of change:	⌘	7.11.4.4: Added possibility to send to SMLC a BSSLAP Abort in case of the ongoing Intra-BSC HO has time out. 10.6: Updated case 1 of section 10.6 replacing SMLC with BSC. This change will match with figure 59, too.
Consequences if not approved:	⌘	7.11.4.4: Inconsistency between figure 59 and 7.11.4.4. It can cause erroneous implementation. 10.6: It can cause wrong implementation.

Clauses affected:	⌘	Sections 7.11.4.4, 10.6
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ 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/3G_Specs/CRs.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.

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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.

********** Modified Section **********

7.11.4 Procedures in the BSC

7.11.4.1 General Procedures

The BSC serving a target MS shall supervise any network or MS location service procedure, including transfer of positioning assistance data to an MS, and shall only allow one such procedure to be active at any time. If a new procedure is instigated by the SMLC for any target MS, the BSC shall cancel any previous procedure without notifying the SMLC or target MS. The new procedure shall then be treated according to the prevailing conditions – e.g. may be rejected if a previous TOA handover attempt was not yet completed. If a location information transfer to an MS initiated by an SMLC is not active, the BSC shall discard any RRLP message or message segment received from the MS. This precludes the initiation of any location service procedure from an MS.

Depending on the location procedure and its current state of execution, a serving BSC may chose to defer certain radio related events (e.g. handover) to avoid interference with location – refer to the later sections for each position method. A serving BSC shall abort all existing location related procedures for a particular target MS without notifying an NSS based SMLC or target MS if the DCCH to the target MS or the SCCP connection to the VMSC or a BSS based SMLC is released. In the event of an abort with a BSS based SMLC, the BSC shall attempt to notify the SMLC using a BSSMAP-LE Perform Location Abort.

7.11.4.2 Rejection of an SMLC Positioning Request

The BSC may reject any request from an SMLC for positioning or transfer of assistance data for a target MS if the request cannot be performed for reasons other than interaction with handover or other RR management. If the request is rejected, the BSC shall return a BSSLAP Reject to the SMLC containing the cause of rejection.

7.11.4.3 Interaction with Inter-BSC or Inter-MSC Handover

The BSC shall reject any request from an SMLC for positioning or transfer of assistance data while an inter-BSC or inter-MSC handover procedure is ongoing and shall return a BSSLAP Abort to the SMLC.

The BSC shall terminate any network or MS positioning procedure or any transfer of RRLP assistance data already in progress if inter-BSC or inter-MSC handover is needed and is not precluded by the particular location procedure and its current state. When a location procedure is terminated and there is an active BSSLAP transaction, the BSC shall return a BSSLAP Abort message to the SMLC after the BSSMAP Handover Required has been sent to the serving MSC. The BSSLAP Abort shall contain the cause of the location procedure failure. When a location procedure is terminated and there is no active BSSLAP transaction, the BSC shall send a BSSAP-LE Perform Location Abort message to the SMLC after the BSSMAP Handover Required has been sent to the serving MSC.

7.11.4.4 Interaction with Intra-BSC Handover and other RR Management Procedures

The BSC shall reject any request from an SMLC for positioning or transfer of assistance data while an intra-BSC handover or other intra-BSC RR management procedure involving the target MS is ongoing and shall return a BSSLAP Reset to the SMLC when the handover or other RR management procedure is complete in the BSC. If the handover or other RR management procedure~~or has~~ times~~d~~ out in the BSC, the BSC shall instead return either a BSSLAP Reset or a BSSLAP Abort to the SMLC.~~.~~

The BSC shall terminate any network or MS positioning procedure or any transfer of RRLP assistance data already in progress if an intra-BSC handover or other intra-BSC RR management procedure is needed and is not precluded by the particular location procedure and its current state. When location procedure is terminated, the BSC shall return a BSSLAP Reset message to the SMLC after the intra-BSC handover or other RR management procedure is complete in the BSC. If the intra-BSC handover or other RR management procedure~~or has~~ times~~d~~ out in the BSC, the BSC shall instead return either a BSSLAP Reset or a BSSLAP Abort to the SMLC. The BSSLAP Reset shall contain a cause indication, the current serving cell identity and may contain measurement information for the target MS (e.g. TA value).

7.11.4.5 Priority of Handover and Other RR Management Procedures

If the transfer of RRLP messages between an SMLC and target MS is interrupted by intra-BSC handover, inter-BSC handover or any other intra-BSC RR management procedure, the BSC shall avoid delay to the handover or RR management procedure by employing the preemption capability defined in GSM 04.06 and 04.08. This allows an RR Handover Command or other RR management command sent to the target MS to be assigned a “high” priority at the data link level enabling preemption of “low” priority RR Application Information messages (carrying RRLP messages) which may have been sent earlier. This procedure ensures that any RRLP data still untransmitted to the MS will be preempted (and discarded) by the data link layer in the BTS prior to transmission of the Handover Command or other RR Management command.

7.11.4.6 Interaction with Segmentation

When requested to transfer a segmented RRLP message between an SMLC and target MS, the BSC shall discard all received RRLP segments if the transfer procedure in the BSC cannot be supported or is aborted. The BSC need not wait until all RRLP segments are received before notifying the SMLC of the failure of the RRLP procedure with a BSSLAP Abort, Reject or Reset message.

If a location service procedure for a target MS is not currently underway or previously failed, the BSC shall discard all BSSLAP segments received from an SMLC for this MS until it receives the first or only segment of a new BSSLAP message. Once a location service procedure has been started involving RRLP message transfer to a target MS, the BSC shall discard all RRLP segments received from the MS until it receives the first or only segment of a new RRLP message. The new RRLP message shall then be treated according to the state of the RRLP message transfer as described in section 7.7.

Further details regarding transfer and segmentation of RRLP messages between a BSC and MS can be found in GSM 04.08.

7.11.4.7 Overload

The BSC may indicate an inability to support location due to overload by rejecting with a cause indicating congestion a BSSMAP Perform Location request received from the MSC. If a BSS based SMLC has rejected a request from the BSC to perform location with a cause indicating congestion, the BSC shall convey the rejection and cause to the MSC if the request was MSC initiated. If the request was initiated by the BSC, the BSC may reduce the frequency of its location requests to the SMLC according to the rules in GSM 09.31, which give precedence to location service requests with a higher priority.

10.6 Error Handling for E-OTD and GPS

This section describes error handling for positioning and transfer of assistance data for E-OTD and GPS. For a description of error handling involving segmentation, refer to section 7.11.4.

Case 1: When the RRLP request comes to BSC for E-OTD and GPS, The BSC will send a BSSLAP reject message to SMLC if the request cannot be supported in the BSC for reasons other than an ongoing intra BSC or inter BSC handover or other ongoing RR management procedure. For an ongoing intra BSC HO or other RR management procedure, the BSC shall return a BSSLAP Reset when the handover or RR management procedure is complete. The SMLC may then start the RRLP request (if there is time) again. For ongoing inter-BSC HO, the ~~SMLC~~ BSC shall return a BSSLAP Abort. The location service request may then restart from either the LCS Client or VMSC).

Case 2: When the RRLP request comes to BSC from SMLC, BSC sends the "RRLP request" to the MS if there is no ongoing HO or other RR management procedure at that point. If an intra-BSC HO or other RR management procedure is initiated in BSC, the BSC sends the HO or other RR management command to MS. A timer will then be started in BSC, the duration of which is network dependent, but typically 6 (six) seconds. Upon receiving the HO of other RR management command, the MS will stop the location procedure and start on handover or other RR management procedure, since this has higher priority than location. The MS will then send the HO complete or other RR management response message to BSC. When this message is received before the expiration of BSC timer, a BSSLAP Reset message will be sent to SMLC from BSC. The Reset will tell SMLC to start another location service request if there is enough time.

Case 3: During intra-BSC HO or other intra-BSC RR management procedure, if a HO complete or RR management procedure completion was not received in BSC and the corresponding timer expired. In this case a reset or abort message will be sent to SMLC indicating MS timeout. The location service may then restart from either the SMLC if a reset was sent or from the LCS Client or VMSC if an abort was sent.

Case 4: If an inter-BSC (or inter-MSC) handover is needed during a location procedure or if the BSC times out on an RRLP response from the target MS, the BSC shall send a BSSLAP Abort to the SMLC. The location service attempt may then be restarted from either the LCS Client or VMSC.

10.6.2 BSS based SMLC

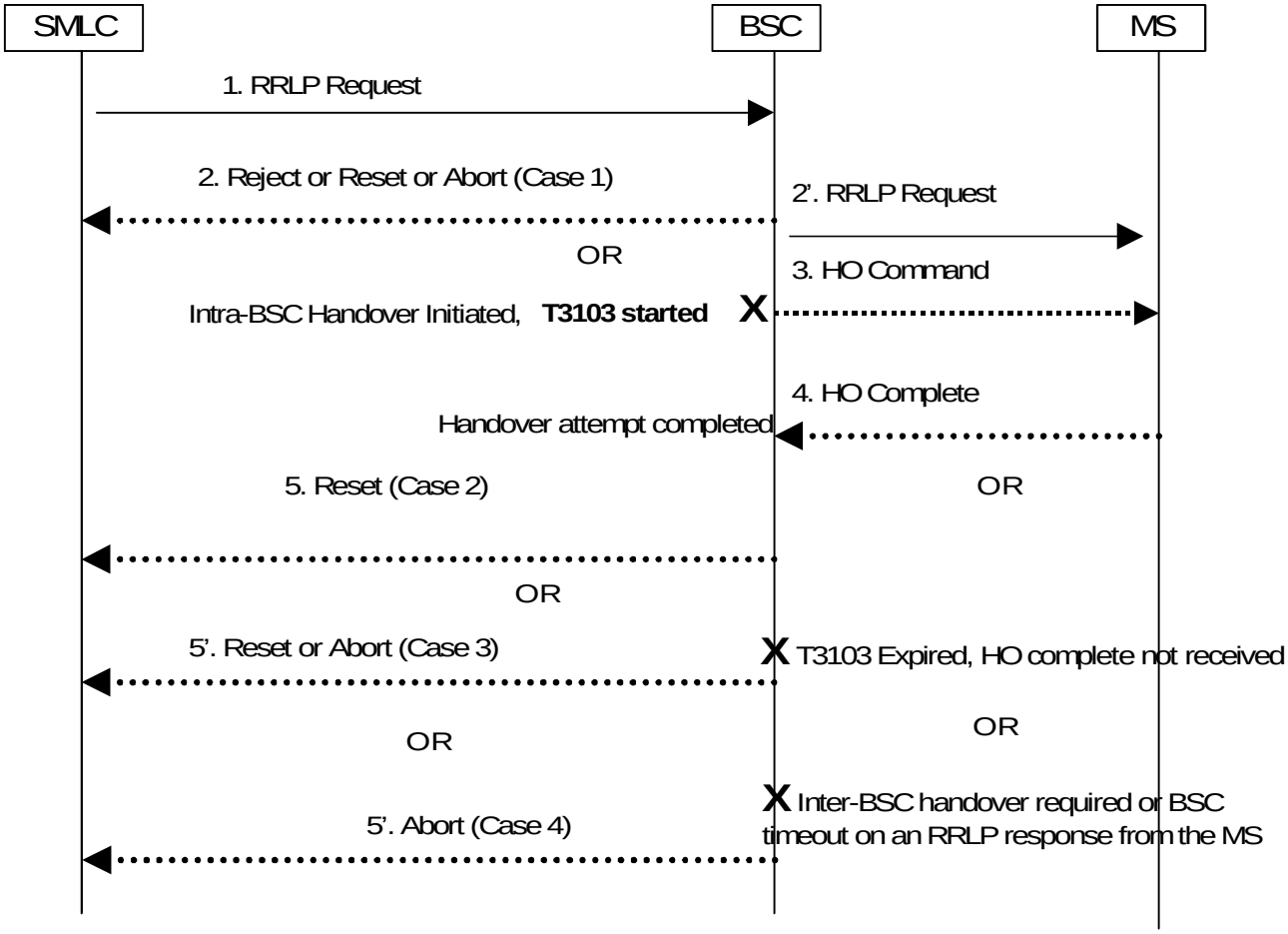

Figure 59

3GPP TSG-SA2#21 Meeting **S2-013254**
Cancun, Mexico, Nov 26-30 2001

CR-Form-v4

CHANGE REQUEST

⌘ **03.71** **CR** **A034** ⌘ ev **-** ⌘ Current version: **8.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Error handling for E-OTD and GPS
Source:	⌘	SIEMENS
Work item code:	⌘	LCS
Date:	⌘	Nov 26th 2001
Category:	⌘	**A**
Release:	⌘	R99

Use one of the following categories:
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Reason for change:	⌘	7.11.4.4: In according to case 3 of section 10.6, when an ongoing intra BSC HO has timed out, the BSC shall terminate any network or MS positioning or transfer of assistance data procedure sending to SMLC either a BSSLAP Reset or a BSSLAP Abort message. 10.6: When the SMLC sends a RRLP request to BSC involved into on ongoing inter-BSC HO, SMLC has not knowledge about the ongoing inter-handover until it receives a BSSLAP Abort from the BSC.
Summary of change:	⌘	7.11.4.4: Added possibility to send to SMLC a BSSLAP Abort in case of the ongoing Intra-BSC HO has time out. 10.6: Updated case 1 of section 10.6 replacing SMLC with BSC. This change will match with figure 59, too.
Consequences if not approved:	⌘	7.11.4.4: Inconsistency between figure 59 and 7.11.4.4. It can cause erroneous implementation. 10.6: It can cause wrong implementation.

Clauses affected:	⌘	Sections 7.11.4.4, 10.6
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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7.11.4 Procedures in the BSC

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The BSC shall terminate any network or MS positioning procedure or any transfer of RRLP assistance data already in progress if inter-BSC or inter-MSC handover is needed and is not precluded by the particular location procedure and its current state. When a location procedure is terminated and there is an active BSSLAP transaction, the BSC shall return a BSSLAP Abort message to the SMLC after the BSSMAP Handover Required has been sent to the serving MSC. The BSSLAP Abort shall contain the cause of the location procedure failure. When a location procedure is terminated and there is no active BSSLAP transaction, the BSC shall send a BSSAP-LE Perform Location Abort message to the SMLC after the BSSMAP Handover Required has been sent to the serving MSC.

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7.11.4.7 Overload

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Case 1: When the RRLP request comes to BSC for E-OTD and GPS, The BSC will send a BSSLAP reject message to SMLC if the request cannot be supported in the BSC for reasons other than an ongoing intra BSC or inter BSC handover or other ongoing RR management procedure. For an ongoing intra BSC HO or other RR management procedure, the BSC shall return a BSSLAP Reset when the handover or RR management procedure is complete. The SMLC may then start the RRLP request (if there is time) again. For ongoing inter-BSC HO, the ~~SMLC~~ BSC shall return a BSSLAP Abort. The location service request may then restart from either the LCS Client or VMSC).

Case 2: When the RRLP request comes to BSC from SMLC, BSC sends the "RRLP request" to the MS if there is no ongoing HO or other RR management procedure at that point. If an intra-BSC HO or other RR management procedure is initiated in BSC, the BSC sends the HO or other RR management command to MS. A timer will then be started in BSC, the duration of which is network dependent, but typically 6 (six) seconds. Upon receiving the HO of other RR management command, the MS will stop the location procedure and start on handover or other RR management procedure, since this has higher priority than location. The MS will then send the HO complete or other RR management response message to BSC. When this message is received before the expiration of BSC timer, a BSSLAP Reset message will be sent to SMLC from BSC. The Reset will tell SMLC to start another location service request if there is enough time.

Case 3: During intra-BSC HO or other intra-BSC RR management procedure, if a HO complete or RR management procedure completion was not received in BSC and the corresponding timer expired. In this case a reset or abort message will be sent to SMLC indicating MS timeout. The location service may then restart from either the SMLC if a reset was sent or from the LCS Client or VMSC if an abort was sent.

Case 4: If an inter-BSC (or inter-MSC) handover is needed during a location procedure or if the BSC times out on an RRLP response from the target MS, the BSC shall send a BSSLAP Abort to the SMLC. The location service attempt may then be restarted from either the LCS Client or VMSC.

10.6.2 BSS based SMLC

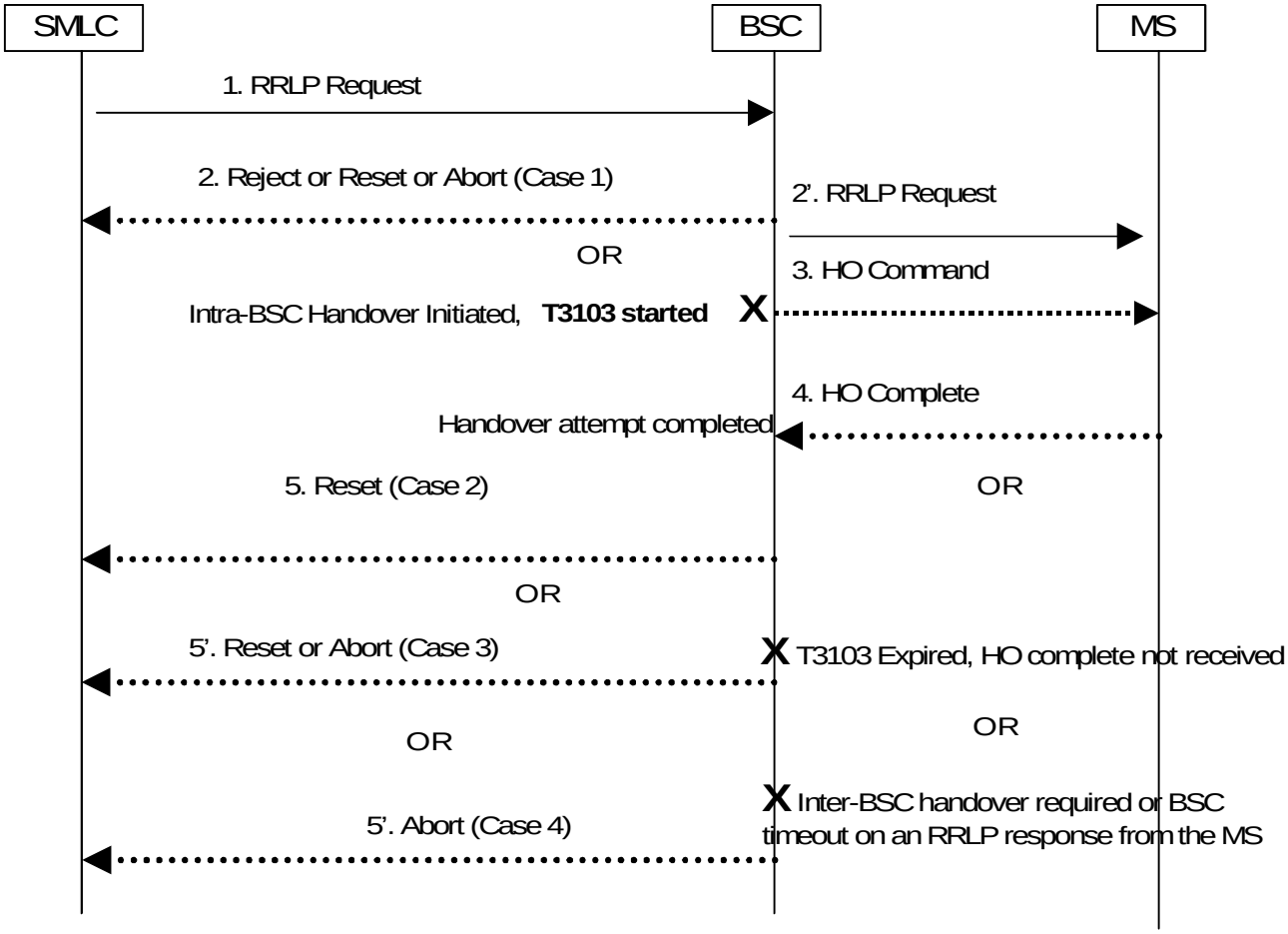

Figure 59

3GPP TSG-SA2 Meeting #20 ***Tdoc S2-012768***
Kobe, Japan, 29 October – 02 November, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.171** **CR** **020** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Wrong node name in privacy check procedures
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-Oct-24
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	A wrong node name is indicated in the Privacy checks for Mobile Terminating Location Request.
Summary of change:	⌘	The node name is corrected.
Consequences if not approved:	⌘	A wrong node name is given, so that the privacy checks are not correctly described.

Clauses affected:	⌘	8.11.3		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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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

8.11.3 UE Privacy Options

The UE privacy options in the SLPP apply to an MT-LR or NI-LR and either indicate that no MT-LR or NI-LR is allowed for the UE (except as may be overridden by the POI or local regulatory requirements) or define the particular classes of LCS client for which an MT-LR or NI-LR for location are allowed, with the following classes being possible:

a) Universal Class – allow positioning by all LCS clients

b) Call related Class – comprises any LCS client to which the UE originated a call that is currently established. For all clients in the call related class, one of the following subscription options shall apply:

- positioning allowed without notifying the UE user (default case)
- positioning allowed with notification to the UE user
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user

c) Non-Call related Class – allow positioning by specific identified LCS Clients or groups of LCS Client with the following restrictions allowed for each identified LCS Client or group of LCS Clients

- Location request allowed only from GMLCs identified in the SLPP
- Location request allowed only from a GMLC in the home country
- Location request allowed from any GMLC (default case)

For each identified value added LCS client in the privacy exception list, one of the following subscription options shall apply:

- positioning allowed without notifying the UE user (default case)
- positioning allowed with notification to the UE user
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user

For all value added LCS clients sending a non-call related MT-LR that are not identified in the privacy exception list, one of the following subscription option shall apply:

- positioning not allowed (default case)
- positioning allowed with notification to the UE user
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
- positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user

d) PLMN operator Class – allow positioning by specific types of client within or associated with the VPLMN, with the following types of client identified:

- clients providing a location related broadcast service
- O&M client in the HPLMN (when the UE is currently being served by the HPLMN)
- O&M client in the VPLMN

- Clients recording anonymous location information without any UE identifier
- Clients enhancing or supporting any supplementary service, IN service, bearer service or teleservice subscribed to by the target UE subscriber

If the UE subscribes to the universal class, any MT-LR or NI-LR shall be allowed by the VMSC. If local regulatory requirements mandate it, any MT-LR for an emergency services LCS client and any NI-LR for an emergency services call origination shall be allowed by the VMSC.

If the UE subscribes to the call-related class, an MT-LR may be allowed if the UE previously originated a call that is still established and the called party number dialled by the UE matches the called party number received from the GMLC. If the called party number conditions are satisfied, the MT-LR shall be allowed if the UE user subscribes to either location without notification or location with notification. If the UE user subscribes to location with notification and privacy verification, the MT-LR shall be allowed following notification to the UE if the UE user either returns a response indicating that location is allowed or returns no response but subscribes to allowing location in the absence of a response. In all other cases, the MT-LR shall be restricted.

If the UE subscribes to the non-call related class, an MT-LR may be allowed by the network if the identity of the LCS client or LCS client group supplied by the GMLC matches the identity of any LCS Client or LCS Client group contained in the UE's SLPP and any other GMLC restrictions associated with this LCS Client identity in the SLPP are also met.

If the LCS client is correctly matched in this way and any GMLC restrictions are satisfied, the MT-LR shall be allowed if the UE user subscribes to either location without notification or location with notification. If the UE user subscribes to location with notification and privacy verification, the MT-LR shall be allowed following notification to the UE if the UE user either returns a response indicating that location is allowed or returns no response but subscribes to location in the absence of a response. In all other cases, the MT-LR shall be restricted.

If the UE subscribes to the non-call related class, an MT-LR from an LCS client that is not contained in the UE's SLPP shall allowed or restricted according to the following conditions. For any non-matched LCS client, the MT-LR shall be allowed if the UE user subscribes to location with notification. If the UE user subscribes to location with notification and privacy verification, the MT-LR shall be allowed following notification to the UE if the UE user either returns a response indicating that location is allowed or returns no response but subscribes to location in the absence of a response. In all other cases, the MT-LR shall be restricted.

If the UE subscribes to the PLMN class, an NI-LR or MT-LR shall be allowed if the client within the VPLMN, for an NI-LR, or the client identified by the GMLC, for an MT-LR, either matches a generic type of client contained in the UE's SLPP or is otherwise authorized by local regulatory requirements to locate the UE.

In evaluating privacy where any address "A" associated with the LCS client (e.g. LCS client ID or GMLC address) needs to be compared with a corresponding address "B" in the target UE's SLPP, a match shall be determined if a match is found for each of the following components of each address:

a) Numbering Plan

b) Nature of Address Indicator

c) Corresponding address digits for all digits in "B" (the digits or initial digits in "A" must match all the digits in "B", but "A" may contain additional digits beyond those in "B")

All addresses shall be transferred to the ~~UE~~MSC/VLR in international format, except for the called party number received from the GMLC during a Call Related MT-LR when the LCS client was reached via IN or abbreviated number routing (e.g. toll free number or emergency call routing). In these cases it is up to the GMLC to use the valid national specific number of the visited country.

3GPP TSG-SA2 Meeting #20 ***Tdoc S2-013006***
Kobe, Japan, 29 October – 02 November, 2001 **(Revised Tdoc S2-012769)**

CR-Form-v3

CHANGE REQUEST

⌘ **23.171** **CR** **021** ⌘ rev **1** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Exception procedures in the VMSC
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-Oct-24
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	The location request cancellation is not supported on LCS stage 3 level. RANAP TS 3GPP 25.413 rel 99 supports the stop reporting only to stop report upon change of service area, so that there is no way to stop a direct report. RAN3 has decided to not add such function in the LS R3-013050 (S2-013005).
Summary of change:	⌘	The cancellation procedures towards RAN for an ongoing LCS request are removed.
Consequences if not approved:	⌘	Misalignment between LCS stage 2 and stage 3 specifications.

Clauses affected:	⌘	8.10.1		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.010
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/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

8.10.1 Procedures in the VMSC

After the VMSC has requested a location service for a particular UE from the SRNC, certain events may occur that may temporarily or permanently interfere with the location service attempt. For each such event notified to the VMSC, the VMSC shall employ one of the following error recovery actions.

Restart the Location Service

This action shall be employed for any event that temporarily impedes a location service attempt and cannot be delayed until the location service attempt is complete. When such an event is notified to the 3G-VMSC, it shall immediately cancel the location service attempt and the associated RANAP dialogue with SRNC, if this still exists by ~~sending a "stop reporting" message to the SRNC~~ releasing all resources specifically allocated for the location attempt and ignoring the location attempt response when received. ~~The "stop reporting" message shall contain the indication about the type of location request to cancel (e.g. direct).~~

After aborting the location request dialogue with the SRNC, the 3G-VMSC may queue the location service request until the event causing the restart has terminated (if not already terminated). The 3G-VMSC may optionally wait for an additional time period (e.g. if the queuing delay is minimal) to ensure that any resources allocated in and by the SRNC have time to be released. The 3G-VMSC may then send another location service request to the SRNC associated with the target UE.

Abort the Location Service

This action shall be employed for any event that permanently impedes a location service attempt, such as loss of the dedicated signaling channel to the target MS. When such an event is notified to the 3G-VMSC, it shall cancel the current location service attempt and the associated RANAP dialogue with the SRNC, if still existing, ~~by sending a "stop reporting" message to the SRNC~~ releasing all resources specifically allocated for the location attempt and ignoring the location attempt response when received. ~~The "stop reporting" message shall contain the indication about the type of location request to cancel (e.g. direct).~~ The 3G-VMSC shall then return an error response to the client or network entity from which the location request was originally received. ~~The 3G-VMSC shall also release all resources specifically allocated for the location attempt.~~

The following table indicates the appropriate error recovery procedure for certain events. For events not listed in the table, the 3G-VMSC need take no action.

Table 8.1: LCS Error Recovery Procedures in the VMSC for certain Events

Event	VMSC Error Recovery
Release of radio channel to the UE	Abort
Any error response from the SRNC except for inter-SRNC or inter-MSC handover	Abort
Inter-SRNC Handover	Restart after handover completed
Inter-MSC Handover	Restart after handover completed

If the RNC is in an overload condition, it may reject a location request by indicating congestion. The MSC may reduce the frequency of future location service requests until rejection due to overload has ceased.

3GPP TSG SA2 Meeting #21 **S2-013403**
Cancun, Mexico, 26. - 30. November, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **050** ⌘ rev **-** ⌘ Current version: **4.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of referred signaling step in MO-Location Request
Source:	⌘	Nokia
Work item code:	⌘	LCS1 ***Date:*** ⌘ 21.11.2001
Category:	⌘	**F** ***Release:*** ⌘ Rel-4

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	Correction of wrong reference.
Summary of change:	⌘	Erroneous reference to a previous signaling step is replaced with the correct functional description
Consequences if not approved:	⌘	Unclear functional requirement

Clauses affected:	⌘	9.2.1
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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 clause >>

9.2 Mobile Originating Location Request

9.2.1 Mobile Originating Location Request, Circuit Switched (CS-MO-LR)

The following procedure shown in figure 9.7 allows an UE to request either its own location, location assistance data or broadcast assistance data message ciphering keys from the network. Location assistance data may be used subsequently by the UE to compute its own location throughout an extended interval using a mobile based position method. The ciphering key enables the UE to decipher other location assistance data broadcast periodically by the network. The MO-LR after location update request may be used to request ciphering keys or GPS assistance data using the follow-on procedure described in TS 24.008 [24]. The procedure may also be used to enable an UE to request that its own location be sent to another LCS client.

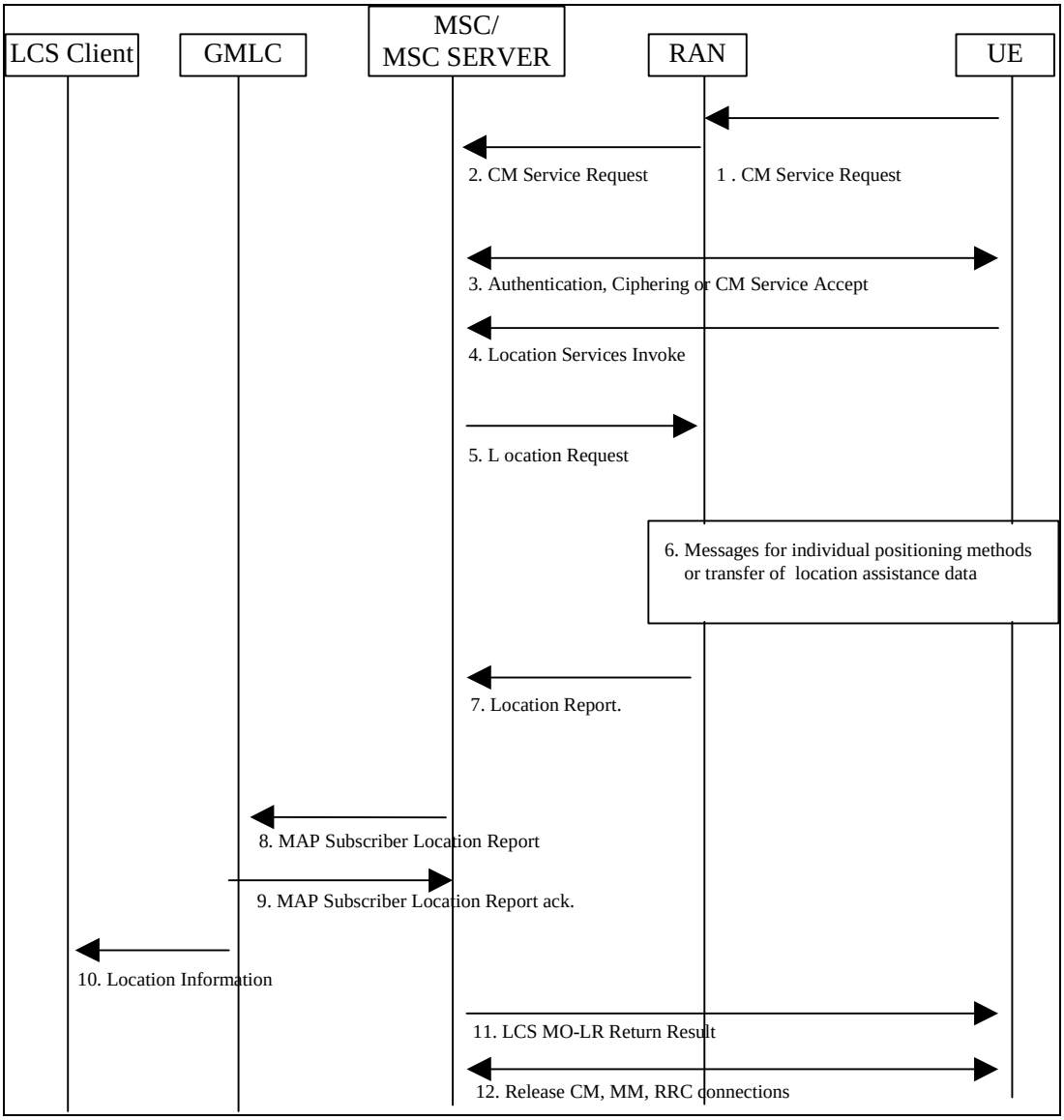

Figure 9.7: General Network Positioning for CS-MO-LR

9.2.1.1 Location Preparation Procedure

1) If the UE is in idle mode, the UE requests a radio connection setup and sends a CM service request indicating a request for a call independent supplementary services to the VMSC/MSC server via RAN.

2) RAN shall convey the CM service request to the core network. If the UE is in dedicated mode, the UE sends a CM Service Request on the already established radio connection.

3) The VMSC/MSC server instigates authentication and ciphering if the UE was in idle mode or returns a Direct Transfer CM Service Accept if the UE was in dedicated mode. The UE will inform the network about its LCS capabilities, as described in chapter 6.3.4.

4) The UE sends a LCS CS-MO-LR Location Services invoke to the VMSC/MSC server. If the UE is requesting its own location or that its own location be sent to another LCS client, this message carries LCS requested QoS information (e.g. accuracy, response time). If the UE is requesting that its location be sent to another LCS client, the message shall include the identity of the LCS client and may include the address of the GMLC through which the LCS client should be accessed. If a GMLC address is not included, the VMSC/MSC server may assign its own GMLC address and may verify that the identified LCS client is supported by this GMLC. If a GMLC address is not available for this case, the VMSC/MSC server shall reject the location request. If the UE is instead requesting location assistance data or ciphering keys, the message specifies the type of assistance data or deciphering keys and the positioning method for which the assistance data or ciphering applies. The VMSC/MSC server verifies in the UE's subscription profile that the UE has permission to request its own location, request that its location be sent to another LCS client or request location assistance data or deciphering keys (whichever applies). If the UE is requesting positioning and has an established call, the VMSC/MSC server may reject the request for certain non-speech call types.

5) The VMSC/MSC server sends a Location Request message to RAN associated with the Target UE. The message indicates whether a location estimate or location assistance data is requested and, in GSM, includes the UE's location capabilities. If the UE's location is requested, the message also includes the requested QoS. If location assistance data is requested, the message carries the requested types of location assistance data.

9.2.1.2 Positioning Measurement Establishment Procedure

6) If the UE is requesting its own location, RAN determines the positioning method and instigates the particular message sequence for this method, as specified in UTRAN Stage 2, TS 25.305 [1] and GERAN Stage 2, TS 43.059 [16]~~the actions described under step 9 for a CS-MT-LR are performed~~. If the UE is instead requesting location assistance data, RAN transfers this data to the UE as described in subsequent clauses in TS 25.305 [1] and TS 43.059 [16] UE.

9.2.1.3 Location Calculation and Release Procedure

7) When a location estimate best satisfying the requested QoS has been obtained or when the requested location assistance data has been transferred to the UE, RAN returns a Location Report to the VMSC/MSC server. This message carries the location estimate or ciphering keys if this was obtained. If a location estimate or deciphering keys were not successfully obtained or if the requested location assistance data could not be transferred successfully to the UE, a failure cause is included in the Location Report.

8) If the UE requested transfer of its location to another LCS client and a location estimate was successfully obtained, the VMSC/MSC server shall send a MAP Subscriber Location Report to the GMLC obtained in step 4 carrying the MSISDN of the UE, the identity of the LCS client, the event causing the location estimate (CS-MO-LR) and the location estimate and its age.

9) The GMLC shall acknowledge receipt of the location estimate provided that is serves the identified LCS client and the client is accessible.

10) The GMLC transfers the location information to the LCS client either immediately or upon request from the client.

11) The VMSC/MSC server returns an CS-MO-LR Return Result to the UE carrying any location estimate requested by the UE, ciphering keys or a confirmation that a location estimate was successfully transferred to the GMLC serving an LCS client.

12) The VMSC/MSC server may release the CM, MM and radio connections to the UE, if the UE was previously idle, and the VMSC/MSC server may record billing information.

NOTE: In case of positioning of emergency call stage 3 of the pervious sequence is naturally omitted.

3GPP TSG SA2 Meeting #21 ***S2-013562***
Cancun, Mexico, 26. - 30. November, 2001 (rev S2-013404)

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **051** ⌘ 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: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of referred signaling step in MO-Location Request
Source:	⌘	Nokia
Work item code:	⌘	LCS1 ***Date:*** ⌘ 21.11.2001
Category:	⌘	**A** ***Release:*** ⌘ Rel-5

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	Correction of wrong reference.
Summary of change:	⌘	Erroneous reference to a previous signaling step is replaced with the correct functional description
Consequences if not approved:	⌘	Unclear functional requirement

Clauses affected:	⌘	9.2.1
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This CR is a mirror of CR050 to 23.271 in tdoc S2-013403

How to create CRs using this form:
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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 clause >>

9.2 Mobile Originating Location Request

9.2.1 Mobile Originating Location Request, Circuit Switched (CS-MO-LR)

The following procedure shown in figure 9.7 allows an UE to request either its own location, location assistance data or broadcast assistance data message ciphering keys from the network. Location assistance data may be used subsequently by the UE to compute its own location throughout an extended interval using a mobile based position method. The ciphering key enables the UE to decipher other location assistance data broadcast periodically by the network. The MO-LR after location update request may be used to request ciphering keys or GPS assistance data using the follow-on procedure described in TS 24.008 [24]. The procedure may also be used to enable an UE to request that its own location be sent to another LCS client.

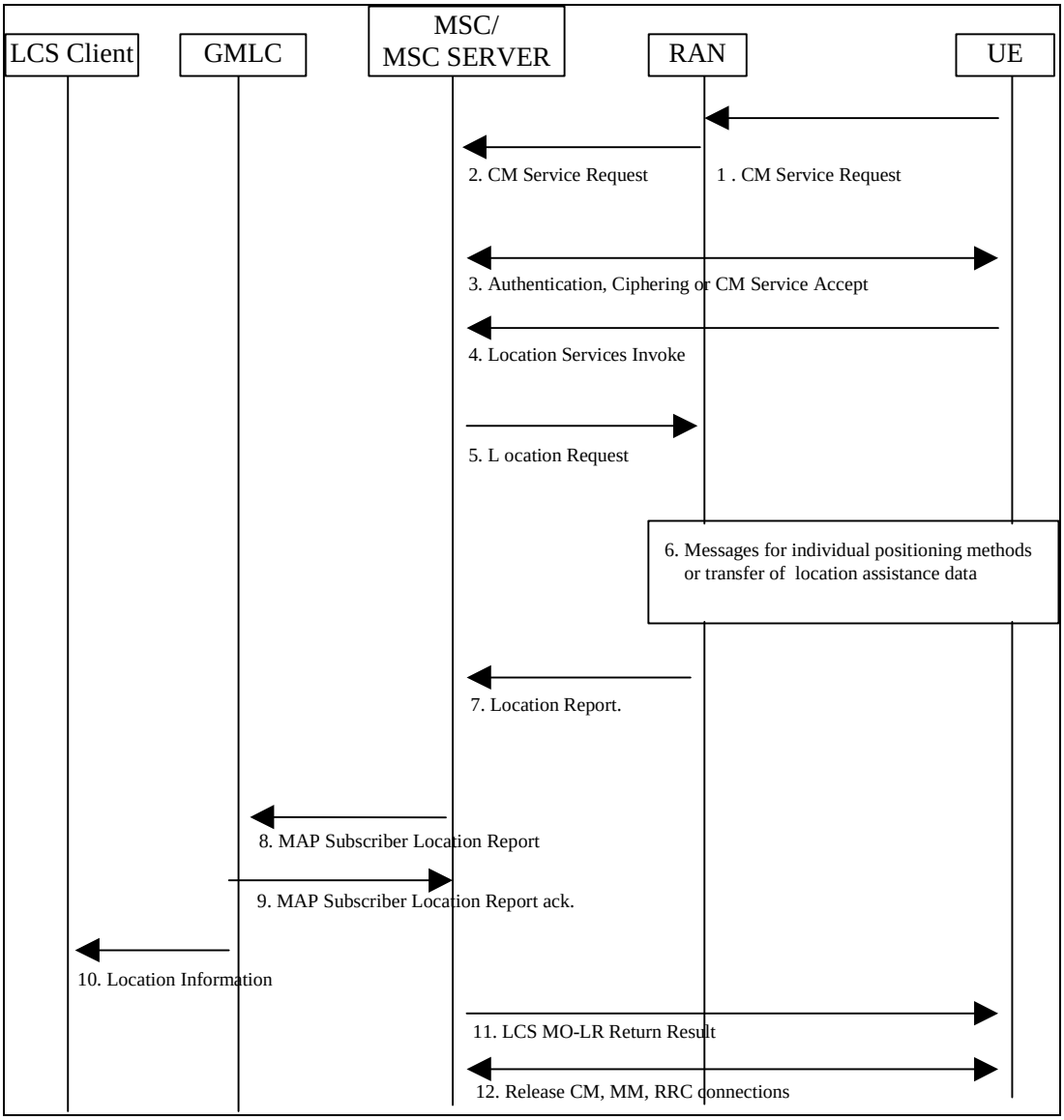

Figure 9.7: General Network Positioning for CS-MO-LR

9.2.1.1 Location Preparation Procedure

1) If the UE is in idle mode, the UE requests a radio connection setup and sends a CM service request indicating a request for a call independent supplementary services to the VMSC/MSC server via RAN.

2) RAN shall convey the CM service request to the core network. If the UE is in dedicated mode, the UE sends a CM Service Request on the already established radio connection.

3) The VMSC/MSC server instigates authentication and ciphering if the UE was in idle mode or returns a Direct Transfer CM Service Accept if the UE was in dedicated mode. The UE will inform the network about its LCS capabilities, as described in chapter 6.3.4.

4) The UE sends a LCS CS-MO-LR Location Services invoke to the VMSC/MSC server. If the UE is requesting its own location or that its own location be sent to another LCS client, this message carries LCS requested QoS information (e.g. accuracy, response time). If the UE is requesting that its location be sent to another LCS client, the message shall include the identity of the LCS client and may include the address of the GMLC through which the LCS client should be accessed. If a GMLC address is not included, the VMSC/MSC server may assign its own GMLC address and may verify that the identified LCS client is supported by this GMLC. If a GMLC address is not available for this case, the VMSC/MSC server shall reject the location request. If the UE is instead requesting location assistance data or ciphering keys, the message specifies the type of assistance data or deciphering keys and the positioning method for which the assistance data or ciphering applies. The VMSC/MSC server verifies in the UE's subscription profile that the UE has permission to request its own location, request that its location be sent to another LCS client or request location assistance data or deciphering keys (whichever applies). If the UE is requesting positioning and has an established call, the VMSC/MSC server may reject the request for certain non-speech call types.

5) The VMSC/MSC server sends a Location Request message to RAN associated with the Target UE. The message indicates whether a location estimate or location assistance data is requested and, in GSM, includes the UE's location capabilities. If the UE's location is requested, the message also includes the requested QoS. If location assistance data is requested, the message carries the requested types of location assistance data.

9.2.1.2 Positioning Measurement Establishment Procedure

6) If the UE is requesting its own location, RAN determines the positioning method and instigates the particular message sequence for this method, as specified in UTRAN Stage 2, TS 25.305 [1] and GERAN Stage 2, TS 43.059 [16]~~the actions described under step 9 for a CS-MT-LR are performed~~. If the UE is instead requesting location assistance data, RAN transfers this data to the UE as described in subsequent clauses in TS 25.305 [1] and TS 43.059 [16] UE.

9.2.1.3 Location Calculation and Release Procedure

7) When a location estimate best satisfying the requested QoS has been obtained or when the requested location assistance data has been transferred to the UE, RAN returns a Location Report to the VMSC/MSC server. This message carries the location estimate or ciphering keys if this was obtained. If a location estimate or deciphering keys were not successfully obtained or if the requested location assistance data could not be transferred successfully to the UE, a failure cause is included in the Location Report.

8) If the UE requested transfer of its location to another LCS client and a location estimate was successfully obtained, the VMSC/MSC server shall send a MAP Subscriber Location Report to the GMLC obtained in step 4 carrying the MSISDN of the UE, the identity of the LCS client, the event causing the location estimate (CS-MO-LR) and the location estimate and its age.

9) The GMLC shall acknowledge receipt of the location estimate provided that is serves the identified LCS client and the client is accessible.

10) The GMLC transfers the location information to the LCS client either immediately or upon request from the client.

11) The VMSC/MSC server returns an CS-MO-LR Return Result to the UE carrying any location estimate requested by the UE, ciphering keys or a confirmation that a location estimate was successfully transferred to the GMLC serving an LCS client.

12) The VMSC/MSC server may release the CM, MM and radio connections to the UE, if the UE was previously idle, and the VMSC/MSC server may record billing information.

NOTE: In case of positioning of emergency call stage 3 of the pervious sequence is naturally omitted.

3GPP TSG-SA WG2, Meeting #21
Cancun, Mexico, November 26 – 30, 2001

Tdoc S2-013359

CR-Form-v4

CHANGE REQUEST

⌘ **23.271** **CR** **041** ⌘ ev ⌘ Current version: **4.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Removal of PDP address from HLR/HSS in the MT-LR procedure
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	November 19, 2001
Category:	⌘	**F**
Release:	⌘	REL-4

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)*

Reason for change:	⌘	The PDP address is not used by HLR/HSS
Summary of change:	⌘	The MT-LR procedure in TS 23.271 v4.3.0, clause 9.1.1 para 2) describes a Send_routing_info_for_LCS from GMLC to HLR "with IMSI, PDP address or MSISDN of this UE". The PDP address is not used between GMLC and HLR
Consequences if not approved:	⌘	TS 23.271 will be in contradiction to the MAP specification TS29.002

Clauses affected:	⌘	9.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

9.1.1 MT-LR routing procedure in PS and CS domain

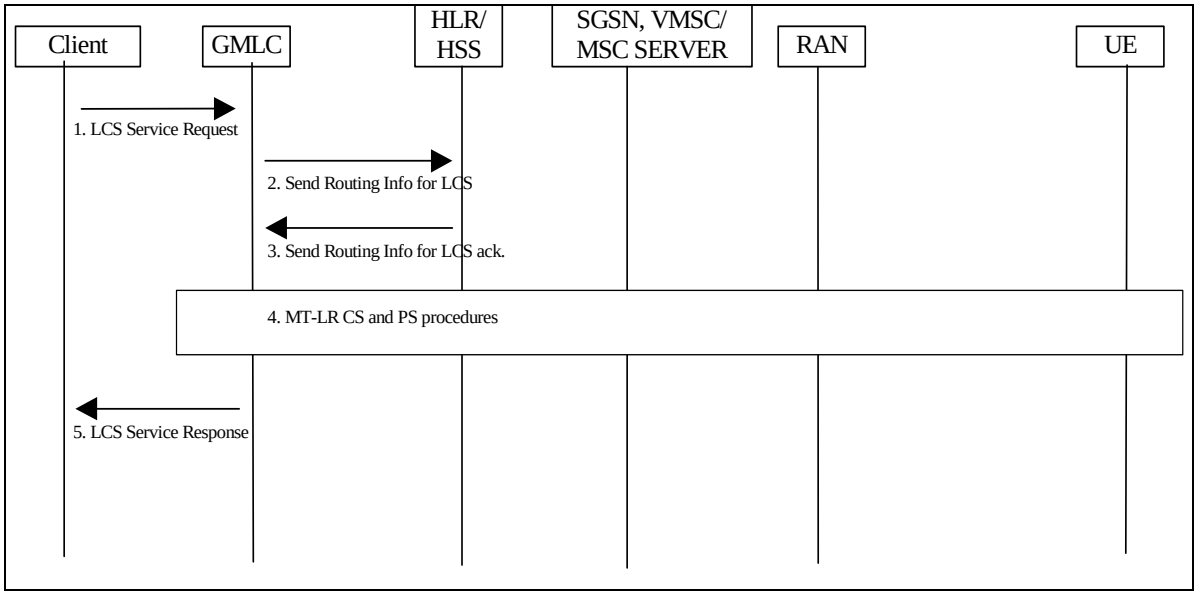

Figure 9.1: General Network Positioning for a MT-LR

1) An external LCS client requests the current location of a target UE from a GMLC. The LCS Client may also request a deferred location request, i.e. based on event. The GMLC verifies the identity of the LCS client and its subscription to the LCS service requested and derives the MSISDN or IMSI or PDP address, (NOTE: IP addressing in this context is FFS, one reason is the dynamic IP addressing used in IPv4.) of the target UE to be located and the LCS QoS from either subscription data or data supplied by the LCS client. For a call related or session related location request, the GMLC obtains and authenticates the called party number of the LCS client. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.
   Note: This means that GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain.

2) If the GMLC already knows both the VMSC/MSC server or SGSN (Note: only applicable to 3G-SGSN in Rel-4) location and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), this step and step 3 may be skipped. Otherwise, the GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI, ~~PDP address~~ or MSISDN of this UE.

3) The HLR/HSS verifies that the calling party SCCP address of the GMLC corresponds to a known GSM/UMTS network element that is authorized to request UE location information. The HLR/HSS then returns one or several of the addresses, the current SGSN and/or VMSC/MSC server and whichever of the IMSI and MSISDN was not provided in step (2) for the particular UE.
   Note: HLR may prioritize between the MSC/VLR or SGSN address sent to GMLC. The priority criteria are for further study.

3GPP TSG-SA WG2, Meeting #21

Tdoc S2-013534
(revision of S2-013360)

Cancun, Mexico, November 26 – 30, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.271** **CR** **042** ⌘ ev **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: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Removal of PDP address from HLR/HSS in the MT-LR procedure
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	November 19, 2001
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)

Reason for change:	⌘	The PDP address is not used by HLR/HSS
Summary of change:	⌘	The MT-LR procedure in TS 23.271 v5.0.0, clause 9.1.1 para 2) describes a Send_routing_info_for_LCS from GMLC to HLR "with IMSI, PDP address or MSISDN of this UE". The PDP address is not used between GMLC and HLR
Consequences if not approved:	⌘	TS 23.271 will be in contradiction to the MAP specification TS29.002

Clauses affected:	⌘	9.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

9.1.1 MT-LR routing procedure in PS and CS domain

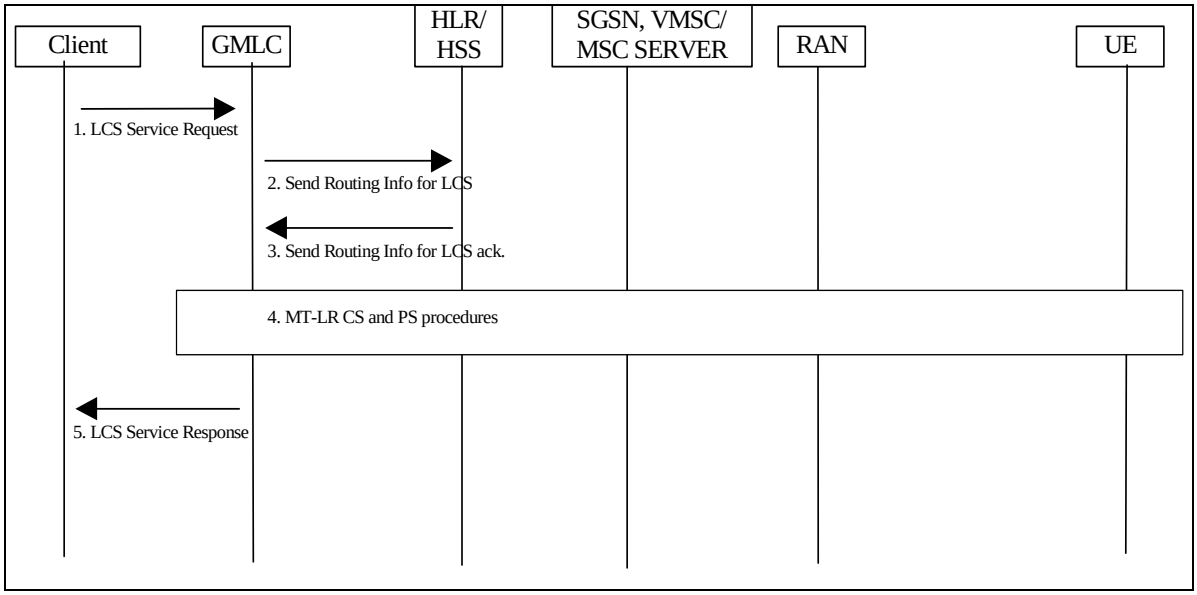

Figure 9.1: General Network Positioning for a MT-LR

1) An external LCS client requests the current location of a target UE from a GMLC. The LCS Client may also request a deferred location request, i.e. based on event. The GMLC verifies the identity of the LCS client and its subscription to the LCS service requested and derives the MSISDN or IMSI or PDP address, (NOTE: IP addressing in this context is FFS, one reason is the dynamic IP addressing used in IPv4.) of the target UE to be located and the LCS QoS from either subscription data or data supplied by the LCS client. For a call related or session related location request, the GMLC obtains and authenticates the called party number of the LCS client. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.
   Note: This means that GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain.

2) If the GMLC already knows both the VMSC/MSC server or SGSN (Note: only applicable to 3G-SGSN in Rel-4) location and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), this step and step 3 may be skipped. Otherwise, the GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI, PDP address or MSISDN of this UE.

Editor´s note: The use of the PDP address for identifying the subscriber is ffs.

3) The HLR/HSS verifies that the calling party SCCP address of the GMLC corresponds to a known GSM/UMTS network element that is authorized to request UE location information. The HLR/HSS then returns one or several of the addresses, the current SGSN and/or VMSC/MSC server and whichever of the IMSI and MSISDN was not provided in step (2) for the particular UE.
   Note: HLR may prioritize between the MSC/VLR or SGSN address sent to GMLC. The priority criteria are for further study.

3GPP TSG-SA2 Meeting #21 ***Tdoc S2-013389***
Cancun, Mexico, 26 – 30 November, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **043** ⌘ rev **-** ⌘ Current version: **4.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Response to LCS client in case of deferred MT-LR
Source:	⌘	Ericsson
Work item code:	⌘	LCS1 ***Date:*** ⌘ 2001-Oct-29
Category:	⌘	**F** ***Release:*** ⌘ Rel-4

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	Mismatch in the requirements concerning the LCS response from the GMLC to the LCS client in case of deferred MT-LR (bullets 3 and 4 in Ch. 9.1.8.1).
Summary of change:	⌘	When the GMLC receives the acknowledgment that a deferred MT-LR procedure has been successfully accepted from the MSC/SGSN, a LCS Service Response message is sent to the LCS client.
Consequences if not approved:	⌘	The GMLC behaviour in case of deferred MT-LR would be not clearly stated.

Clauses affected:	⌘	9.1.8.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ 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/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

9.1.8 Mobile Terminating Deferred Location Request

Figure 9.6a illustrates the procedures for a Deferred Location Request, where the Location Report is returned based on a event.

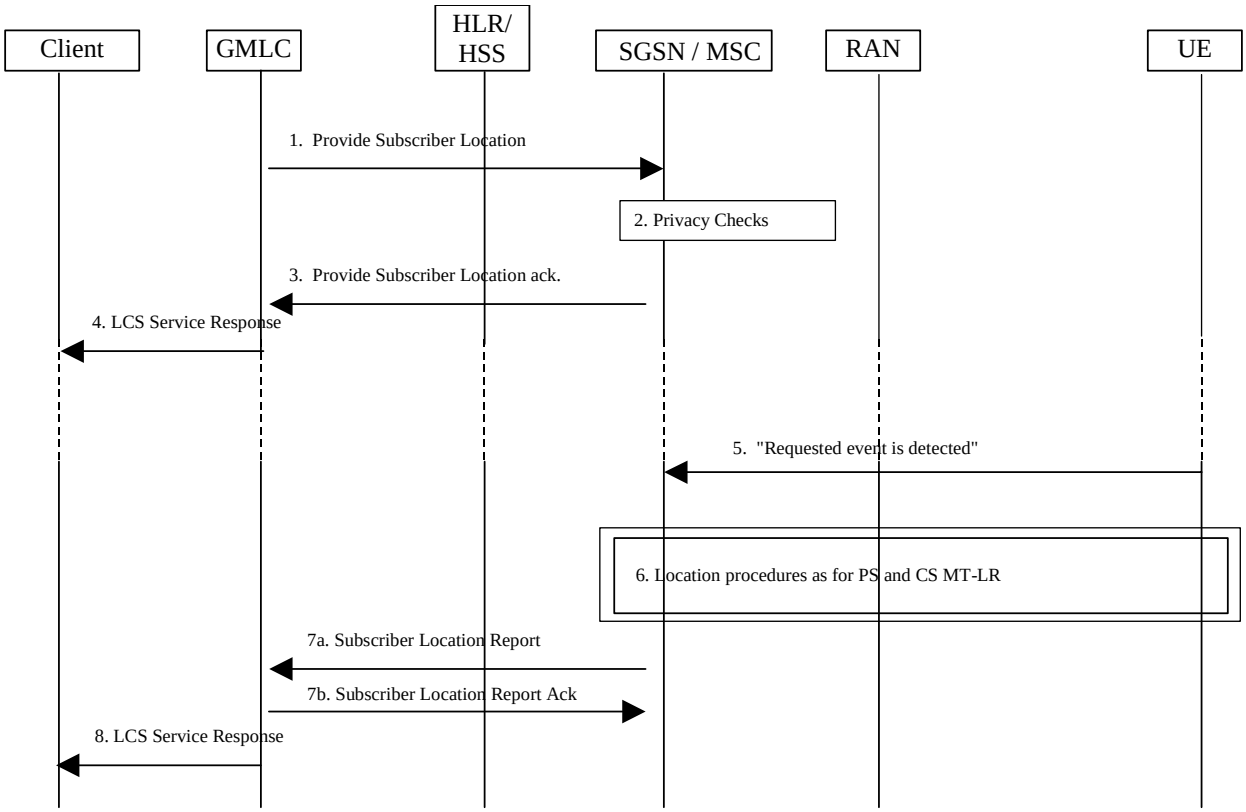

Figure 9.6a: General Network Positioning for a Deferred MT-LR

9.1.8.1 Deferred Location Request Procedure

1) Provide Subscriber Location is received in SGSN/MSC as described in 9.1.2/9.1.6. In addition, the Deferred Location Request includes the event that shall trigger the sending of Location Report.

2) If the SGSN/MSC cannot support the deferred location request for the specified event (for temporary or permanent reasons), a Provide Subscriber Location return error shall be returned in step 3 with a suitable cause. The SGSN/MSC verifies that the LCS client is allowed to position the requested UE according to subscription information (no interaction at this stage with the UE). If not, a Provide Subscriber Location return error is returned in step 3.

3) If the SGSN/MSC can support the deferred location request for the specified event and the privacy checks in step 2 are satisfied, a Provide Subscriber Location ack. shall be returned to the GMLC without a location estimate. ~~The GMLC will at this stage not return any response to the LCS Client. It will instead due to the Deferred Location Request wait for a Subscriber Location Report message from SGSN/MSC.~~

4) The GMLC then returns the LCS Service Response to the LCS Client to notify whether the request was successfully accepted or not.

9.1.8.2 Location Report Procedure

5) Immediately following step 3, the SGSN/MSC shall verify if the requested event is already satisfied (e.g. UE available inferred from a current transaction) or can be invoked immediately (e.g. by paging the UE and receiving a page response). If requested event is not existing the SGSN/MSC waits until it has occurred or until some maximum time has expired.

=> In case the SGSN/MSC receives an indication that the UE has moved to another SGSN/MSC while it is waiting for the requested event to happen, a Subscriber Location Report is directly sent to the GMLC with the information that MT-LR must be re-initiated against the new SGSN/MSC. The adress of the new SGSN/MSC is included in Subscriber Location Report if available. (If new SGSN/MSC adress was included, the GMLC continues at step 1 above, otherwise it continues with an interrogation against HLR as described in 9.1.1.)

6) When the requested event is detected, the SGSN/MSC will proceed with the location request as described in 9.1.2/9.1.6.

If either security or privacy checks fails, a Subscriber Location Report is returned with appropriate error cause indicating termination of the deferred location request.

7) When location information has been obtained from the RAN, the SGSN/MSC returns the Subscriber Location Report. Included in the report is an indication that this is a response to a previously sent deferred location request.

If the location information could not be obtained, or the SGSN/MSC for some other reason decides to not wait any longer for the requested event to occur (ex. timer expires), the Subscriber Location Report will be returned with an appropriate error cause indicating termination of the deferred location request.

8) GMLC then returns the LCS Service Response to the LCS Client as in 9.1.2/9.1.6.

3GPP TSG-SA2 Meeting #21 ***Tdoc S2-013390***
Cancun, Mexico, 26 – 30 November, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **044** ⌘ rev **-** ⌘ 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: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Response to LCS client in case of deferred MT-LR
Source:	⌘	Ericsson
Work item code:	⌘	LCS1
Date:	⌘	2001-Oct-29
Category:	⌘	**A**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	Mismatch in the requirements concerning the LCS response from the GMLC to the LCS client in case of deferred MT-LR (bullets 3 and 4 in Ch. 9.1.8.1).
Summary of change:	⌘	When the GMLC receives the acknowledgment that a deferred MT-LR procedure has been successfully accepted from the MSC/SGSN, a LCS Service Response message is sent to the LCS client.
Consequences if not approved:	⌘	The GMLC behaviour in case of deferred MT-LR would be not clearly stated.

Clauses affected:	⌘	9.1.8.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This CR is mirrored from the CR 043 on Rev 4.3.0 of Rel-4 TS.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

9.1.8 Mobile Terminating Deferred Location Request

Figure 9.6a illustrates the procedures for a Deferred Location Request, where the Location Report is returned based on a event.

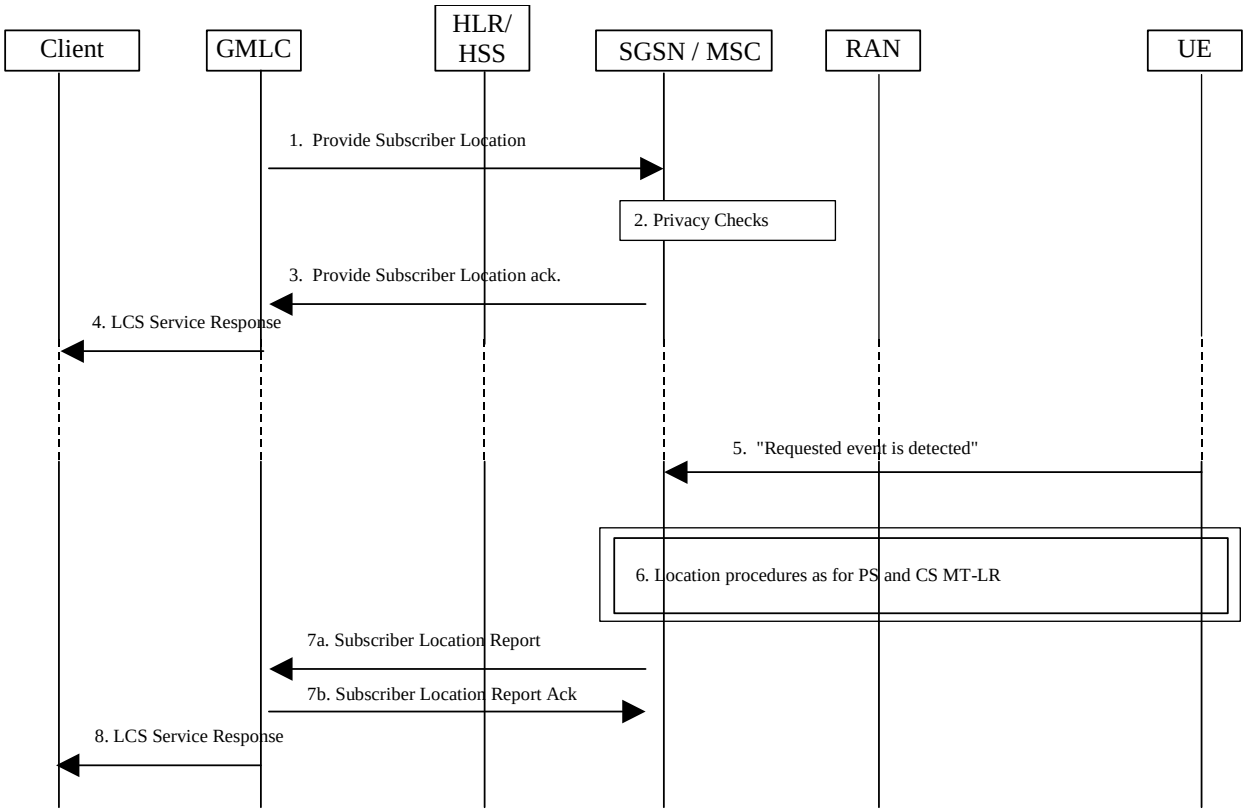

Figure 9.6a: General Network Positioning for a Deferred MT-LR

9.1.8.1 Deferred Location Request Procedure

1) Provide Subscriber Location is received in SGSN/MSC as described in 9.1.2/9.1.6. In addition, the Deferred Location Request includes the event that shall trigger the sending of Location Report.

2) If the SGSN/MSC cannot support the deferred location request for the specified event (for temporary or permanent reasons), a Provide Subscriber Location return error shall be returned in step 3 with a suitable cause. The SGSN/MSC verifies that the LCS client is allowed to position the requested UE according to subscription information (no interaction at this stage with the UE). If not, a Provide Subscriber Location return error is returned in step 3.

3) If the SGSN/MSC can support the deferred location request for the specified event and the privacy checks in step 2 are satisfied, a Provide Subscriber Location ack. shall be returned to the GMLC without a location estimate. ~~The GMLC will at this stage not return any response to the LCS Client. It will instead due to the Deferred Location Request wait for a Subscriber Location Report message from SGSN/MSC.~~

4) The GMLC then returns the LCS Service Response to the LCS Client to notify whether the request was successfully accepted or not.

9.1.8.2 Location Report Procedure

5) Immediately following step 3, the SGSN/MSC shall verify if the requested event is already satisfied (e.g. UE available inferred from a current transaction) or can be invoked immediately (e.g. by paging the UE and receiving a page response). If requested event is not existing the SGSN/MSC waits until it has occurred or until some maximum time has expired.

=> In case the SGSN/MSC receives an indication that the UE has moved to another SGSN/MSC while it is waiting for the requested event to happen, a Subscriber Location Report is directly sent to the GMLC with the information that MT-LR must be re-initiated against the new SGSN/MSC. The adress of the new SGSN/MSC is included in Subscriber Location Report if available. (If new SGSN/MSC adress was included, the GMLC continues at step 1 above, otherwise it continues with an interrogation against HLR as described in 9.1.1.)

6) When the requested event is detected, the SGSN/MSC will proceed with the location request as described in 9.1.2/9.1.6.

If either security or privacy checks fails, a Subscriber Location Report is returned with appropriate error cause indicating termination of the deferred location request.

7) When location information has been obtained from the RAN, the SGSN/MSC returns the Subscriber Location Report. Included in the report is an indication that this is a response to a previously sent deferred location request.

If the location information could not be obtained, or the SGSN/MSC for some other reason decides to not wait any longer for the requested event to occur (ex. timer expires), the Subscriber Location Report will be returned with an appropriate error cause indicating termination of the deferred location request.

8) GMLC then returns the LCS Service Response to the LCS Client as in 9.1.2/9.1.6.

3GPP TSG SA WG2 Meeting #21 ***S2-013450***
Cancun, Mexico, 26th - 30th November 2001

CR-Form-v5

CHANGE REQUEST

⌘ **23.271** **CR** **055** ⌘ **rev** **0** ⌘ 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: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Editorial correction to front page
Source:	⌘	Vodafone
Work item code:	⌘	***Date:*** ⌘ 21st November 2001
Category:	⌘ **D**	***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)

Reason for change:	⌘	The Change History for TS 23.271 V 5.0.0 shows that it was created from version 4.3.0 + CR in October 2001,following its approval at TSG SA #13. However, the front cover still has Release 4 in the title.
Summary of change:	⌘	Amend Release 4 to read Release 5 on front cover.
Consequences if not approved:	⌘	Confusion!

Clauses affected:	⌘			
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ 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/3G_Specs/CRs.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.

3GPP TS 23.271 V5.0.0 (2001-10)

Technical Specification

AMEMDED TEXT:

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Functional stage 2 description of LCS (Release 45)

Keywords
UMTS, location, stage 2

3GPP

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3GPP TSG SA2 Meeting #21
Cancun, Mexico, 26th - 29th November 2001

S2-013561
(S2-013397)

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **049** ⌘ 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: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☒

Title:	⌘	SGSN Exception procedures.
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-10-18
Category:	⌘	**F**
Release:	⌘	Rel5

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	Update the LCS Error Recovery handling in SGSN with the new events due to GERAN. This is based on the decision taken at SA2#19 by LS S2-012352 that all error cases where core network is involved should be described in the 23.271 specification only.
Summary of change:	⌘	1) Update the text to reflect also a more Gb like handling in the description in addition to the existing Iu like description. 2) Add the events that are currently described in the GERAN LCS Stage2. The following new events are included: - Intra SGSN RA Update - Inter SGSN RA Update - P-TMSI Reallocation
Consequences if not approved:	⌘	The Error Recovery handling for LCS in GERAN will be unclear.

Clauses affected:	⌘	9.4.3		
Other specs Affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
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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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

9.4.3 Procedures in the SGSN

After the SGSN has requested a location service for a particular UE from RAN, certain events may occur that may temporarily or permanently interfere with the location service attempt. For each such event notified to the SGSN, the SGSN shall employ one of the following error recovery actions.

Restart the Location Service

This action shall be employed for any event that temporarily impedes a location service attempt and cannot be delayed until the location service attempt is complete. When such an event is notified to the SGSN, it shall immediately cancel the location service attempt and the associated signaling dialogue with RAN, if this still exists by sending a "stop reporting" (Iu mode) or "location abort" (A/Gb mode) message to RAN. The "stop reporting"/"location abort" message shall contain the reason for the location procedure cancellation.

After aborting the location request dialogue with RAN, the SGSN may queue the location service request until the event causing the restart has terminated (if not already terminated). The SGSN may optionally wait for an additional time period (e.g. if the queuing delay is minimal) to ensure that any resources allocated in and by RAN have time to be released. The SGSN may then send another location service request to RAN associated with the target UE.

Abort the Location Service

This action shall be employed for any event that permanently impedes a location service attempt, such as loss of the radio channel to the target UE. When such an event is notified to the SGSN, it shall cancel the current location service attempt and the associated signaling dialogue with RAN, if still existing, by sending a "stop reporting"/"location abort" message to RAN. The "stop reporting"/"location abort" message shall contain the reason for the location procedure cancellation. The SGSN shall then return an error response to the client or network entity from which the location request was originally received. The SGSN shall also release all resources specifically allocated for the location attempt.

The following table indicates the appropriate error recovery procedure for certain events. For events not listed in the table, the SGSN need take no action.

Table 9.2: LCS Error Recovery Procedures in the SGSN for certain Events

Event	SGSN Error Recovery
Release of radio channel to the UE	Abort
Any error response from RAN causing unavailable signalling connections	Abort
SRNC relocation (Iu mode ~~UMTS~~ only)	[Note: This is being discussed in RAN WG2 and RAN WG3.]
Suspend of GPRS services (A/Gb mode ~~GSM~~ only)(During CS connection for class B UE)	Abort
Intra SGSN Routing Area Update (A/Gb mode only)	Restart
Inter SGSN Routing Area Update	Abort (Note: GMLC may restart)
Standalone P-TMSI Reallocation (A/Gb mode only)	Restart

9.4.4 Procedures in the UE

3GPP TSG-SA-WG2 Meeting #20 **S2-012804**
Kobe, Japan, 29th October – 2nd November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.271** **CR** **036** ⌘ rev **-** ⌘ Current version: **4.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Clarification on the interworking issue with Pre-REL4 LCS PS Domain
Source:	⌘	NEC
Work item code:	⌘	LCS
Date:	⌘	9th October 2001
Category:	⌘	**F** Agreed by concensus
Release:	⌘	REL4

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)*

Reason for change:	⌘	This contribution clarifies that there is no interworking issue foreseen with Pre-REL4 PS Domain. Since LCS performed in PS domain was introduced in REL4, there is no such case that R99 and earlier SGSN interworks with REL4 HLR for LCS REL4.
Summary of change:	⌘	This CR deletes the 'Note' that describes the possible editorial updates. This CR also adds a text that clarifies no interworking issue with Pre-REL4 LCS PS Domain.
Consequences if not approved:	⌘	The impacts for Pre-REL4 LCS in PS domain remain unclear.

Clauses affected:	⌘	10.5, 10.5.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ 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/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

10.5 Interworking with pre-Rel'4 LCS

This clause describes possible scenarios for interworking with a node which support only pre-Rel'4 LCS features and functions. Since LCS service performed in PS domain was introduced in REL4, there is no Pre-REL4 interworking issue for PS domain.

10.5.1 Interworking with the VLR supporting only pre-Rel'4 LCS

The VLR that supports only pre-Rel'4 LCS cannot handle the extended privacy control for call-related/call-unrelated class of the Rel'4 LCS. That is, the VLR cannot provide the extended call-related/call-unrelated class service to the user who subscribes to the Rel'4 LCS. Therefore HLR/HSS does not send the subscriber data on call-related/call-unrelated class for users who subscribe to the call-related class of Rel'4 LCS to the VLR that supports only pre-Rel'4 LCS. The HLR/HSS is notified whether the VLR supports Rel'4 LCS or not by an indication , which indicates the highest LCS core network signalling capability the VLRsupports, from the VLR during location update procedure. The following two LCS core network signalling capabilities are identified in the current version of this specification.

- LCS core network signalling capability set 1: R98 and R99 LCS (pre-Rel'4 LCS)
- LCS core network signalling capability set 2: Rel'4 or later LCS

The serving node, which notified the HLR/HSS that it supports LCS core network signalling capability set 2, shall be able to handle the extended LCS Client list and LCS Client List for call-related class from the HLR.

~~[Note: this interworking scenario can be also applied for PS domain. Generalization of the description in this sub clause to cover both CS and PS domain should be done.][Note2: the concept of LCS capability set is newly introduced in Rel4 so that it doesn't appear in the specifications for R98 and R99 LCS]~~

3GPP TSG SA2 Meeting #20

S2-013013
(S2-012866)

Kobe, Japan, 29. Oct - 2. Nov

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **038** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	LCS Capability Handling for GPRS MS's.			
Source:	⌘	Ericsson			
Work item code:	⌘	LCS	***Date:*** ⌘	2001-11-01	
Category:	⌘	**B**	***Release:*** ⌘	Rel5	

Use one of the following categories:
- ***F*** *(essential 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)*

Reason for change: ⌘

This contribution solves the problem as raised by GERAN related to MS's that supports GPRS but not support LCS for GPRS, and the possible implications for the GMLC and other nodes in the core network as described in LS S2-012019 (G2-010199).

Due to that LCS for GPRS is standardised in a later release of the standard than LCS for GSM and even later than GPRS itself, it is entirely possible (even likely) to have MS's that supports both LCS for GSM and GPRS, but does not support LCS for GPRS. In this case, if the request for positioning is initially sent to the SGSN node, the positioning may fail in SGSN if the MS does not support LCS for GPRS, whereas if the request had been sent to MSC, it would have been successful.

When GMLC during an MT-LR asks HLR for routing information (i.e. SGSN and/or MSC address) the HLR can return both the SGSN and the MSC address, but as HLR have no information related to whether MS supports LCS or not it will not be able to tell GMLC whether it should use SGSN or MSC.

If the information whether MS supports LCS or not could be made available for HLR then HLR would be able to provide GMLC with an answer that would increase the chance to succeed with the positioning attempt.

For a time critical location request this might be the difference between an acceptable and a not acceptable response seen from the LCS Client point of view.

Summary of change: ⌘

Introduce a flag in the UPDATE GPRS LOCATION message. SGSN may use this to inform HLR whether MS supports LCS for GPRS or not.

Consequences if not approved:	⌘	The positioning may be unsuccessful for GPRS attached MS's.

Clauses affected:	⌘	6.3.5, 6.3.7 and 9.1.1			
Other specs Affected:	⌘	X	Other core specifications	⌘	29.002
			Test specifications		
			O&M Specifications		
Other comments:	⌘				

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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.

6.3.5 MSC/VLR

The MSC/VLR contains functionality responsible for UE subscription authorization and managing call-related and non-call related positioning requests of LCS. The MSC is accessible to the GMLC via the Lg interface. The LCS functions of MSC are related to charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services. If connected to SGSN through the Gs interface, it checks whether the UE is GPRS attached to decide whether to page the UE on the A/Iu or Gs interface.

The MSC/VLR may inform HLR/HSS about the UE's LCS Capabilities in the MAP UPDATE LOCATION message, during Registration and Inter MSC Update Location procedures.

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6.3.7 SGSN

The SGSN contains functionality responsible for UE subscription authorization and managing positioning requests of LCS. The SGSN is accessible to the GMLC via the Lg interface. The LCS functions of SGSN are related to charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services.

The SGSN may inform HLR/HSS about the UE's LCS Capabilities for GPRS in the MAP UPDATE GPRS LOCATION message, during Attach and Inter SGSN Routing Area Update procedures.

The SGSN forwards the circuit-swiched paging request received from the Gs interface to the BSS/RNC.

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9.1 Mobile Terminating Location Request

9.1.1 MT-LR routing procedure in PS and CS domain

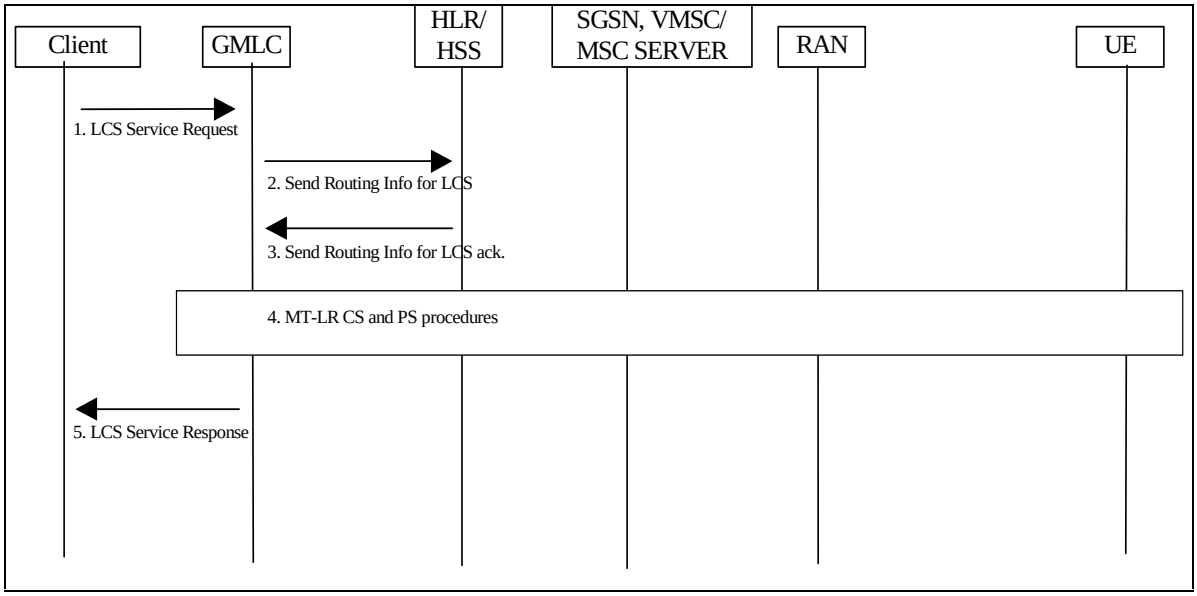

Figure 9.1: General Network Positioning for a MT-LR

1) An external LCS client requests the current location of a target UE from a GMLC. The LCS Client may also request a deferred location request, i.e. based on event. The GMLC verifies the identity of the LCS client and its subscription to the LCS service requested and derives the MSISDN or IMSI or PDP address, (NOTE: IP addressing in this context is FFS, one reason is

the dynamic IP addressing used in IPv4.) of the target UE to be located and the LCS QoS from either subscription data or data supplied by the LCS client. For a call related or session related location request, the GMLC obtains and authenticates the called party number of the LCS client. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.
Note: This means that GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain.

2) If the GMLC already knows both the VMSC/MSC server or SGSN location and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), this step and step 3 may be skipped. Otherwise, the GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI, PDP address or MSISDN of this UE.

3) The HLR/HSS verifies that the calling party SCCP address of the GMLC corresponds to a known GSM/UMTS network element that is authorized to request UE location information. The HLR/HSS then returns one or several of the addresses, the current SGSN and/or VMSC/MSC server and whichever of the IMSI and MSISDN was not provided in step (2) for the particular UE.
Note: HLR may prioritize between the MSC/VLR or SGSN address sent to GMLC. The prioritisation might be based on information received from SGSN and/or MSC/VLR concerning the MS's capabilities for LCS. Other priority criteria are for further study.

4) In case GMLC receives only the MSC/VLR address, the MT LR proceeds as the CS-MT-LR procedure described in 9.1.2. In case GMLC receives only the SGSN address, the MT LR proceeds as the PS-MT-LR procedure described in 9.1.6. In case the GMLC receives several of the following addresses, SGSN, VMSC and/or MSC Server, it has to decide where to send the location request. If the requested MT-LR is known to be associated with a CS call, the CS-MT-LR procedure shall be invoked. If the requested MT-LR is associated with a PS session, the PS-MT-LR procedure only shall be invoked. Otherwise, both CS-MT-LR and PS-MT-LR are applicable. If LCS Client indicated deferred location request, GMLC shall indicate this together with applicable event type (ex. MS available) in requested PS/CS-MT-LR, see 9.1.8.

NOTE: The order in which these procedures are invoked and whether one or both procedures are used may depend on subscription information for the LCS client, possible priority information returned by the HSS or information already stored in the GMLC (e.g. obtained from previous location requests).

5) GMLC sends the location service response to the LCS client. If the LCS client requires it, the GMLC may first transform the universal location co-ordinates provided by the SGSN or MSC/MSC server into some local geographic system. The GMLC may record billing for both the LCS client and inter-network revenue charges from the SGSN or MSC/MSC server's network.

The detailed CS-MT-LR and PS-MT-LR procedures in step 4 of figure 9.1 are described in 9.1.2 and 9.1.6.
The detailed procedure for deferred PS/CS-MT-LR is described in 9.1.8.