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Technical Specification

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LTE;
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Foreword

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Contents

Foreword

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

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1 Scope

The present document gives the stage 3 description of the Location Service (LCS) operations for mobile station. These operations shall apply to both CS and PS domain.

The group of location services operations is divided into two different classes:

- Network initiated location services operations (clause 4);
- Mobile initiated location services operations (clause 5).

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] 3GPP TS 21.905: "Abbreviations and acronyms".

[2] 3GPP TS 23.271: "Functional stage 2 description of LCS".

[3] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".

[4] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)"

3 Definitions and abbreviations

Abbreviations used in the present document are listed in 3GPP TS 21.905 and 3GPP TS 23.271.

The following terms are used in the present document:

- **MS,** Mobile Station. The present document makes no distinction between MS and UE.

4 Network initiated location services operations

4.1 Location Notification

4.1.1 Normal operation

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the MS. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component (figure 4.1).

If the timer T(LCSN) expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interprete this by applying the default treatment defined in TS 23.271 (i.e. dissallow location if barred by subscription and allow location if allowed by subscription).

In the case of location notification no response is required from the MS, the MS shall terminate the dialoque by sending a RELEASE COMPLETE message containing a LocationNotification return result.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080

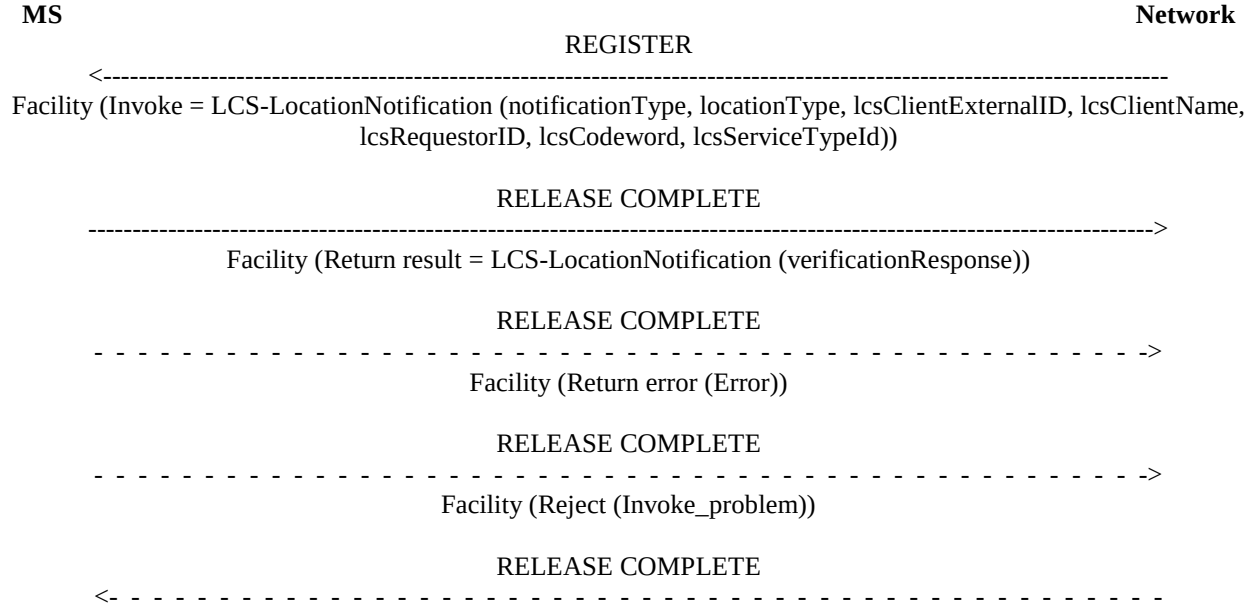

Figure 4.1: Location Notification

4.2 Deferred MT-LR Area Event

4.2.1 Area Event Request

The network invokes a Deferred MT-LR Area Event procedure by sending a REGISTER message containing an LCS-Area Event invoke component to the MS.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080

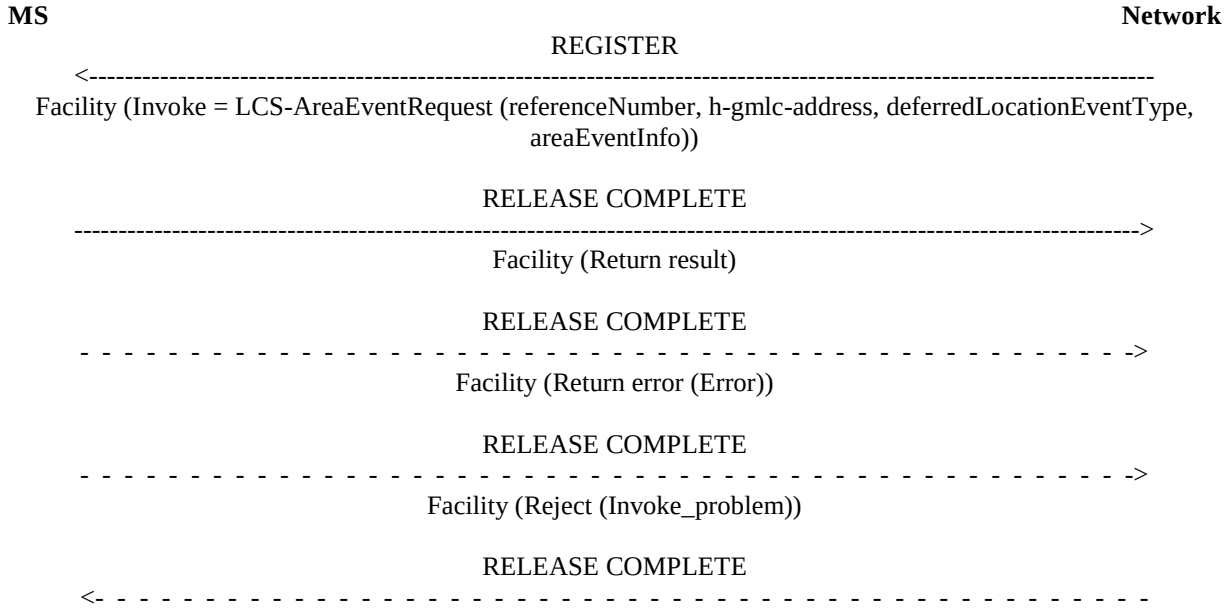

Figure 4.2: Area Event Request

4.2.2 Area Event Report

The MS invokes an Area Event Report by sending a REGISTER message to the network containing an LCS-AreaEventReport invoke component. SS Version Indicator value 1 or above shall be used.

The MS may use the Area Event Report also when cancelling the Area Event Request while monitoring the event.

The receiving network entity shall forward the Area Event Report to the H-GMLC which was included in the invoke component directly or via its associated V-GMLC.

The MS may terminate the dialogue by sending a RELEASE COMPLETE message for a single location request (see figure 4.3). The MS may also initiate another Area Event Report operation by sending a FACILITY message to the network containing an LCS-AreaEventReport invoke component (see figure 4.4). After the Area Event Report operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

If the network cannot successfully process the Area Event Report received from the MS, it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

If the network has returned a result to the MS in a FACILITY message but, after some PLMN administered time period has elapsed, the network has not received either a new Area Event Report operation in a FACILITY message or a RELEASE COMPLETE message from the MS, the network may clear the transaction by sending a RELEASE COMPLETE message.

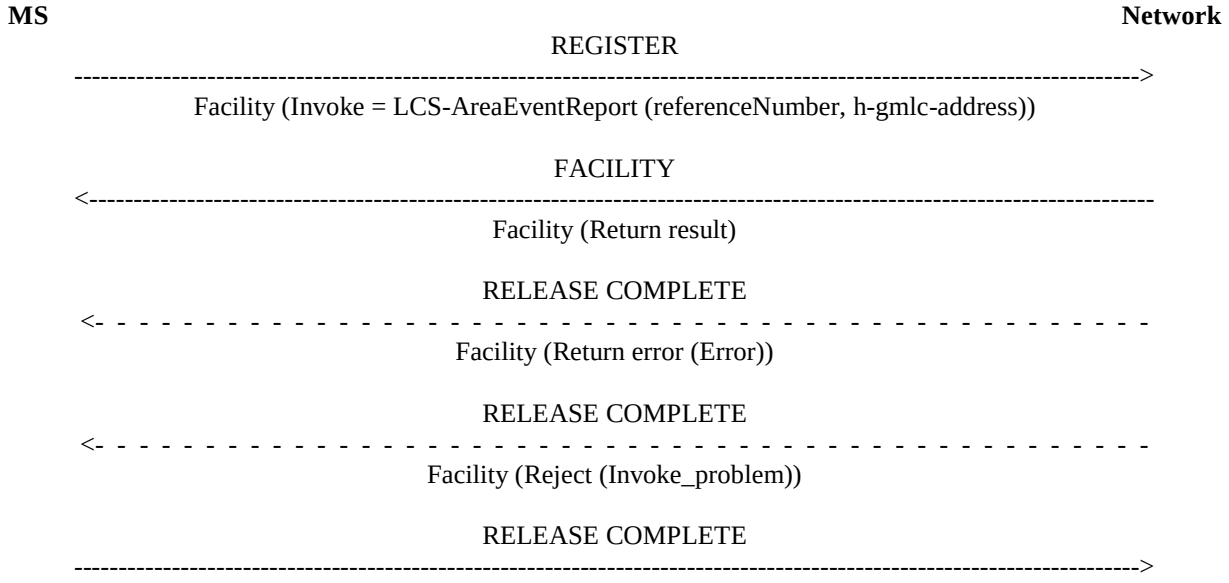

Figure 4.3: Single Area Event Report

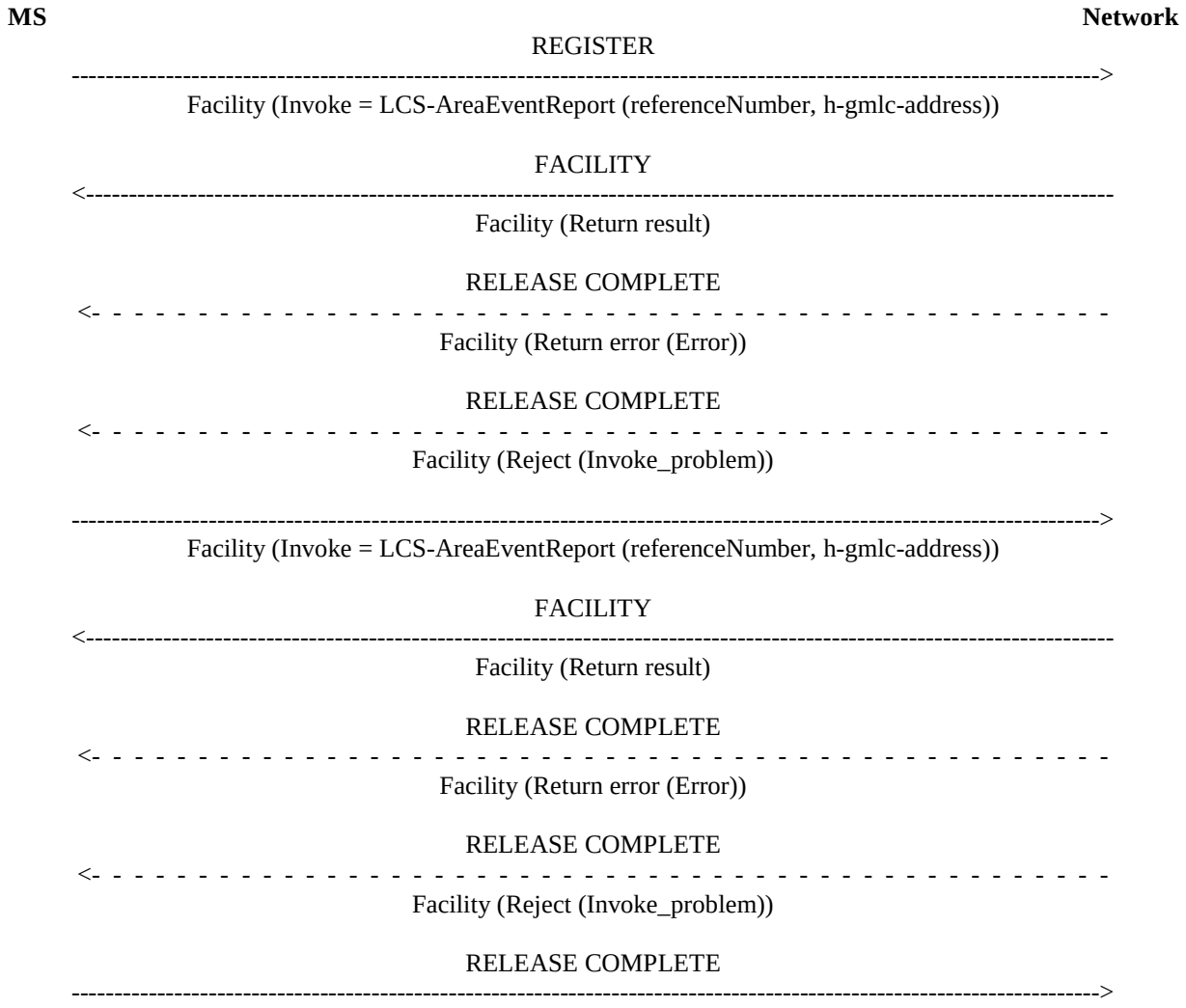

Figure 4.4: Multiple Area Event Reports

4.2.3 Area Event Cancellation

The network invokes a Deferred MT-LR Area Event Cancellation procedure by sending a REGISTER message containing an LCS-Area Event Cancellation invoke component to the MS.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080

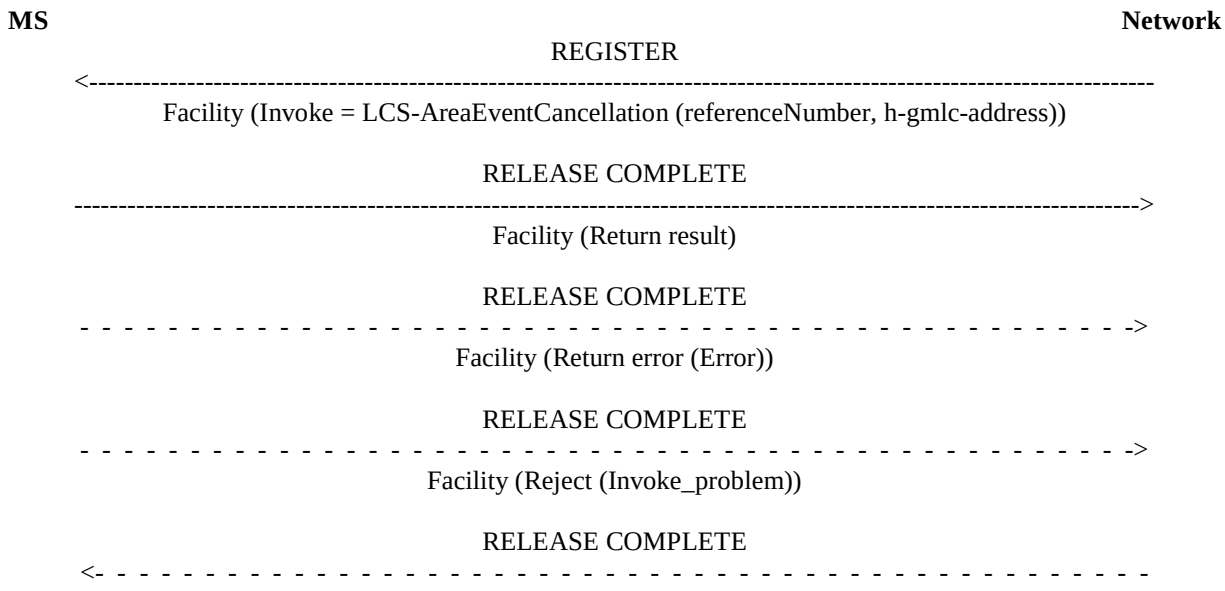

Figure 4.5: Area Event Cancellation

4.3 Deferred MT-LR Periodic Location Event

4.3.1 MT-LR LCS Periodic Location

The network invokes a Deferred MT-LR Periodic Location Event by sending a REGISTER message containing an LCS Periodic Location invoke component to the MS.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

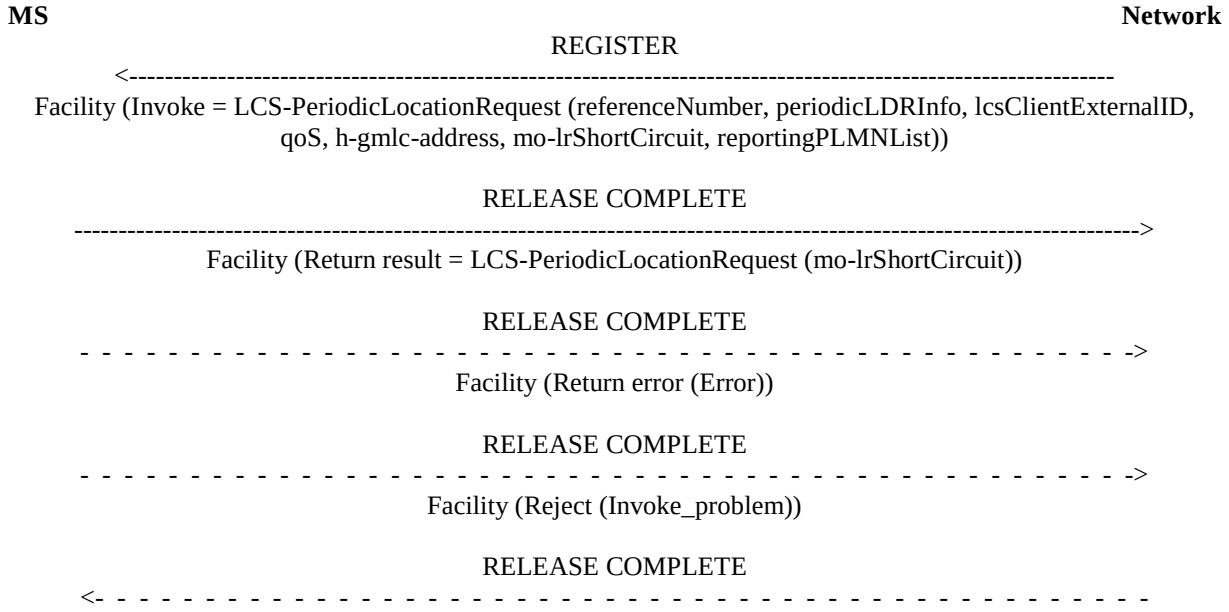

Figure 4.6: Periodic Location Request

4.3.2 LCS Location Update

The network invokes a location update procedure by sending a REGISTER message containing an LCS Location Update invoke component to the MS.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

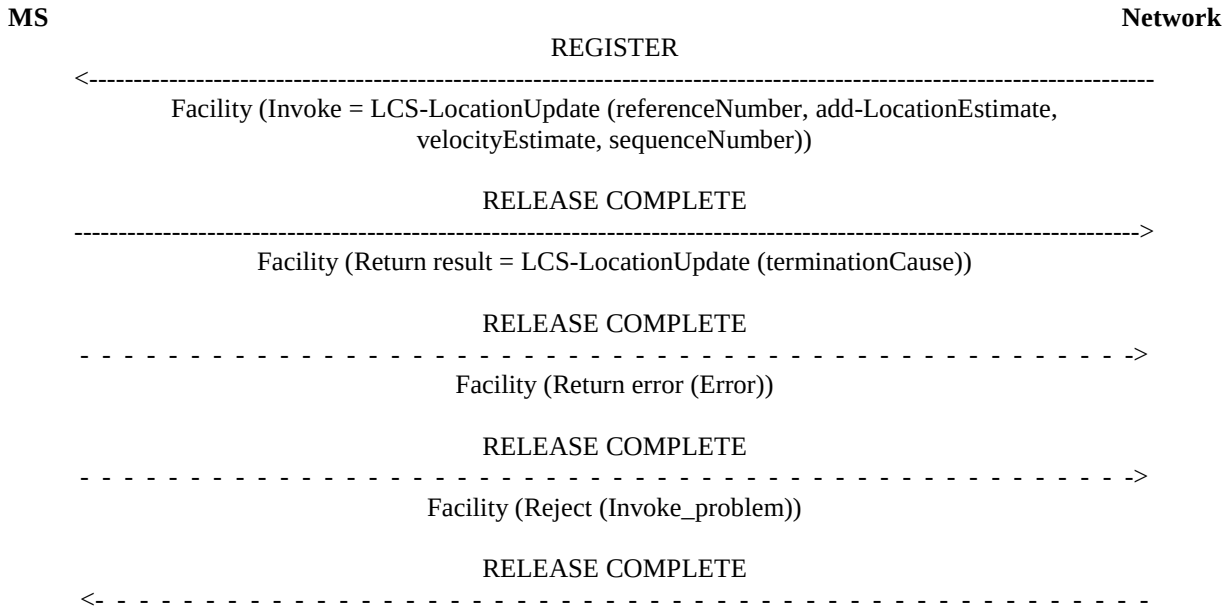

Figure 4.7: Location Update

4.3.3 Periodic Event Cancellation

The network invokes a Deferred MT-LR Periodic Location Cancellation procedure by sending a REGISTER message containing an LCS-Periodic Location Cancellation invoke component to the MS.

If the MS is unable to process the request received from the network, it shall return an error indication by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

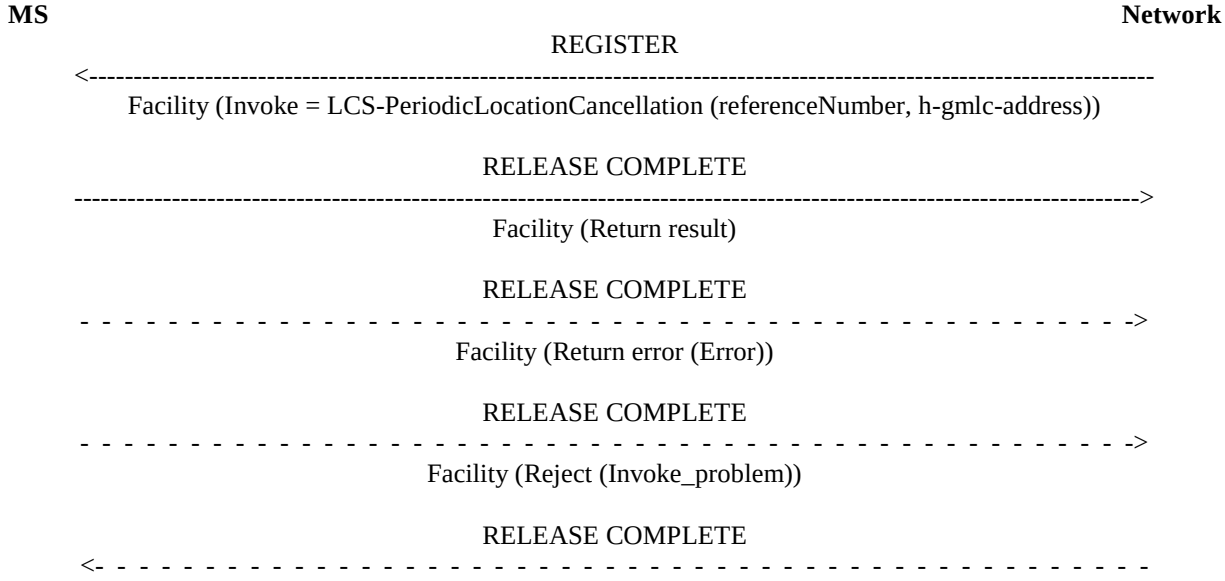

Figure 4.8: Periodic Location Cancellation

5 Mobile initiated location services operations

5.1 Mobile Originated Location Request (MO-LR)

5.1.1 Normal operation

The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

The receiving network entity shall initiate the handling of location request in the network. The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component. When location estimate is kept in the network entity and this information satisfies the requested accuracy and the requested maximum age of location, then the network may reuse this information and the positioning measurement procedure may be skipped.

The network shall pass the result of the location procedure to the MS only if the location estimate is given in a format that the MS supports, as indicated by either the presence (and content) or the absence of the parameter supportedGADShapes, which may be sent by the MS in the LCS-MOLR operation.

The MS may terminate the dialogue by sending a RELEASE COMPLETE message in the case of single location request (see figure 5.1). The MS may also initiate another location request operation by sending a FACILITY message to the network containing a LCS-MOLR invoke component (see figure 5.2). After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

If the network is unable to successfully fulfil the request received from the MS (e.g. to provide a location estimate or location assistance information), it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080. If the network is unable to provide a location estimate due to lack of support in the MS for the type of shape of the location estimate, then it shall use the error Facility Not Supported.

If the network has returned a result to the MS in a FACILITY message but, after some PLMN administered time period has elapsed, has not received either a new location request operation in a FACILITY message or a RELEASE

COMPLETE message from the MS, the network may clear the transaction by sending a RELEASE COMPLETE message.

During the MO-LR operation the MS shall run a timer T(LCSL). This timer is started when the operation is sent, and stopped when a response is received from the network. If this timer expires the MS shall assume that the operation has failed, and may terminate the dialogue by sending a RELEASE COMPLETE message, and shall inform the user of the failure.

To support Periodic Location features (see TS 23.271 for details), the LCS-MOLR Invoke and the LCS-MOLR Return Result components carry the periodic location information between the MS and the network. These information are applicable to the instigation, cancellation, and reporting of the periodic location event and the location estimates.

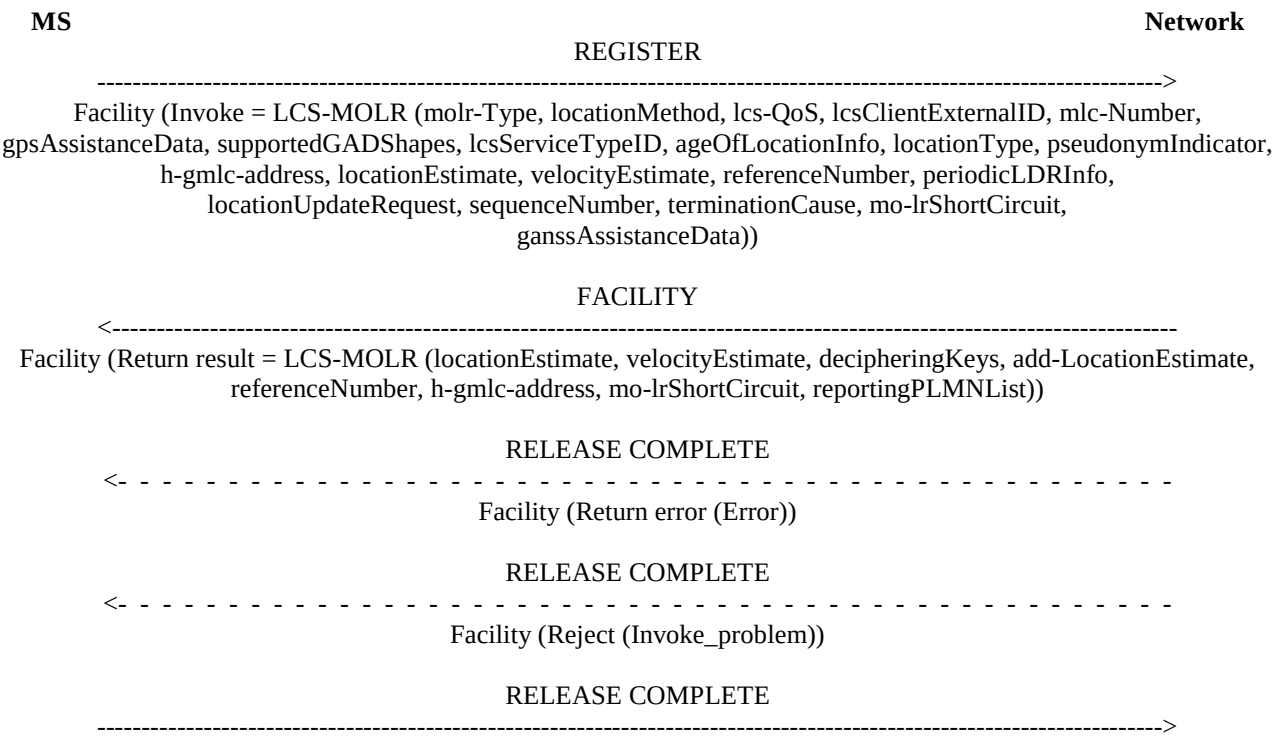

Figure 5.1: Single mobile originated location request

Figure 5.2: Multiple mobile originated location requests

Annex A (informative): Change History

Change history						
Meeting#	**Spec**	**Version**	**CR**	**<Phase>**	**New Version**	**Subject/Comment**
CN#07	24.030	-	-	R99	3.0.0	04.30 v7.1.0 - Transferred to 3GPP
CN#08	24.030	3.0.0	001r1	R99	3.1.0	Clarifications on GSM vs. UMTS specific parts
CN#08	24.030	3.0.0	002	R99	3.1.0	Correction of MO-LR procedure for LCS
CN#11	24.030	3.1.0		Rel-4	4.0.0	Version increased from R99 to Rel-4 after CN#11
CN#11	24.030	3.1.0	003r1	Rel-4	4.0.0	Adaptation of SS to PS domain
CN#12	24.030	4.0.0	005	Rel-4	4.1.0	Handle new parameters in LCS-MOLR
CN#14	24.030	4.1.0	009	Rel-4	4.2.0	Specify usage of SS Version Indicator
CN#14	24.030	4.1.0	011	Rel-4	4.2.0	Correction of MO-LR procedure
CN#15	24.030	4.2.0	012	Rel-5	5.0.0	Introduction of the 'Requestor ID'
CN#16	24.030	5.0.0	013	Rel-5	5.1.0	LCS: Codeword and Service Type
CN#22	24.030	5.1.0	014r1	Rel-6	6.0.0	Deferred MT-LR Area Event
CN#23	24.030	6.0.0	015	Rel-6	6.1.0	Removal of R-GMLC Address
CN#23	24.030	6.0.0	016	Rel-6	6.1.0	MO-LR Service Identity support
CN#26	24.030	6.1.0	020r1	Rel-6	6.2.0	Correction of missing description for T(LCSN) and T(LCSL)
CN#27	24.030	6.2.0	023r1	Rel-6	6.3.0	Pseudonym indicator support in MO-LR
CT#29	24.030	6.3.0	024r1	Rel-7	7.0.0	Enabling the Providing of Velocity
CT#29	24.030	7.0.0	0025	Rel-7	7.1.0	Addition of Periodic Location Feature Support
CT#36	24.030	7.1.0	0026r1	Rel-7	7.2.0	Add Assisted GANSS as a New Positioning Method
CT#36	24.030	7.1.0	0028	Rel-7	7.2.0	Unimplemented CR for Reuse of UEs location
CT#42	24.030	7.2.0		Rel-8	8.0.0	Upgraded unchanged from Rel-7
2009-12	-	8.0.0	-	Rel-9	9.0.0	Update to Rel-9 version (MCC)

History

Document history		
V9.0.0	January 2010	Publication