

**3GPP TSG CN Plenary Meeting #12
Stockholm, Sweden, 13th - 15th June 2001**

Tdoc NP-010347

Source: TSG CN WG4
Title: CRs on Rel-4 Work Item LCS1
Agenda item: 8.8
Document for: APPROVAL

Introduction:

This document contains 2 CRs on Rel-4 Work Item "LCS1", that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #12 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
24.080	009		N4-010665	Rel-4	OTDOA location method to be added	F	4.0.0
29.002	268	3	N4-010783	Rel-4	MS presence notification procedure for LCS	B	4.3.0

CHANGE REQUEST

⌘ **TS 24.080 CR 009** ⌘ rev ⌘ Current version: **4.0.0** ⌘

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:	⌘ OTDOA location method to be added		
Source:	⌘ CN4		
Work item code:	⌘ LCS1	Date:	⌘ 8.5.2001
Category:	⌘ F	Release:	⌘ REL-4
Use <u>one</u> 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 <u>one</u> 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:	⌘ MS should be able to request OTDOA assistance data via the core network. Alligment to the stage 2 specification 23.271 v. 4.1.0.
Summary of change:	⌘ MS based and MS assisted OTDOA assistance data types added
Consequences if not approved:	⌘ The OTDOA positioning method added in Release 4 UTRAN will not be fully supported. Mobile Originated positioning as described in 23.271 will not be supported for OTDOA.

Clauses affected:	⌘ 4.4.2
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications ⌘ CR 25.413-xxx <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
Other comments:	⌘ (A corresponding CR to TS 25.413 RANAP will be provided to RAN WG3.)

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.

4.4.2 ASN.1 data types

...

```
LocationMethod ::= ENUMERATED {  
    msBasedEOTD      (0),  
    msAssistedEOTD   (1),  
    assistedGPS      (2),  
    .../,  
    msBasedOTDOA     (3),  
    msAssistedOTDOA  (4)  
}
```

-- exception handling:

-- an unrecognized value shall be rejected by the receiver with a return error cause of

-- unexpected data value.

CHANGE REQUEST

⌘ **29.002 CR 268** ⌘ rev **3** ⌘ 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

Title:	⌘ MS presence notification procedure for LCS		
Source:	⌘ CN4		
Work item code:	⌘ LCS1	Date:	⌘ 18. May. 2001
Category:	⌘ F	Release:	⌘ REL-4
<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>	

Reason for change:	⌘ UE presence notification procedure, which enables the network to notify the LCS Client of the location estimate when the mobile station becomes reachable, is agreed to be introduced into LCS.		
Summary of change:	⌘ Following modifications were made to introduce this new type of location service. 1) Parameter "Deferred MT-LR Data" is added in Subscriber Location Report message. "Deferred MT-LR Data" indicates the deferred location event type, the location information and termination cause to the GMLC. 2) "Deferred location event type" is added to Location Type. And "Activate Deferred Location" and "Cancel Deferred Location" are added to Location Estimate type. 3) "Current MSC Number" and "Current SGSN Number" are added to Subscriber Location Report operation to inform the current node number to the GMLC.		
Consequences if not approved:	⌘ Misalignment between stage 2 and stage 3 descriptions.		

Clauses affected:	⌘ 7.6, 7.6.11.2, 7.6.11.3, 7.6.11.9, 7.6.11.10, 7.6.11.12, 13A, 17.7.13, 24B		
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ 23.271-026r4	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> 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.

7.6 Definition of parameters

Following is an alphabetic list of parameters used in the common MAP-services in subclause 7.3:

Application context name	7.3.1	Refuse reason	7.3.1
Destination address	7.3.1	Release method	7.3.2
Destination reference	7.3.1	Responding address	7.3.1
Diagnostic information	7.3.4	Result	7.3.1
Originating address	7.3.1	Source	7.3.5
Originating reference	7.3.1	Specific information	7.3.1/7.3.2/7.3.4
Problem diagnostic	7.3.6	User reason	7.3.4
Provider reason	7.3.5		

Following is an alphabetic list of parameters contained in this clause:

Absent Subscriber Diagnostic SM	7.6.8.9	Invoke Id	7.6.1.1
Access connection status	7.6.9.3	ISDN Bearer Capability	7.6.3.41
		IST Alert Timer	7.6.3.66
		IST Information Withdrawn	7.6.3.68
		IST Support Indicator	7.6.3.69
Access signalling information	7.6.9.5	Kc	7.6.7.4
Additional Absent Subscriber	7.6.8.12	Linked Id	7.6.1.2
Diagnostic SM			
Additional number	7.6.2.46	LMSI	7.6.2.16
Additional signal info	7.6.9.10	Location Information	7.6.2.30
Additional SM Delivery Outcome	7.6.8.11		
Age Indicator	7.6.3.72	Location update type	7.6.9.6
		Long Forwarded-to Number	7.6.2.22A
		Long FTN Supported	7.6.2.22B
Alert Reason	7.6.8.8	Lower Layer Compatibility	7.6.3.42
		LSA Information	7.6.3.56
		LSA Information Withdraw	7.6.3.58
		MC Information	7.6.4.48
		MC Subscription Data	7.6.4.47
Alert Reason Indicator	7.6.8.10	Mobile Not Reachable Reason	7.6.3.51
Alerting Pattern	7.6.3.44	Modification request for CSI	7.6.3.81
All GPRS Data	7.6.3.53	Modification request for SS Information	7.6.3.82
All Information Sent	7.6.1.5	More Messages To Send	7.6.8.7
AN-apdu	7.6.9.1		
APN	7.6.2.42	MS ISDN	7.6.2.17
Authentication set list	7.6.7.1	MSC number	7.6.2.11
B-subscriber Address	7.6.2.36	MSIsdn-Alert	7.6.2.29
		Multicall Bearer Information	7.6.2.52
		Multiple Bearer Requested	7.6.2.53
		Multiple Bearer Not Supported	7.6.2.54
B subscriber Number	7.6.2.48	MWD status	7.6.8.3
		NbrUser	7.6.4.45
B subscriber subaddress	7.6.2.49	Network Access Mode	7.6.3.50
Basic Service Group	7.6.4.40	Network node number	7.6.2.43
Bearer service	7.6.4.38	Network resources	7.6.10.1
		Network signal information	7.6.9.8
Call Barring Data	7.6.3.83	New password	7.6.4.20
Call barring feature	7.6.4.19	No reply condition timer	7.6.4.7
Call barring information	7.6.4.18	North American Equal Access	7.6.2.34
		preferred Carrier Id	
Call Direction	7.6.5.8	Number Portability Status	7.6.5.14
Call Forwarding Data	7.6.3.84	ODB Data	7.6.3.85
Call Info	7.6.9.9	ODB General Data	7.6.3.9
Call reference	7.6.5.1	ODB HPLMN Specific Data	7.6.3.10
Call Termination Indicator	7.6.3.67		
Called number	7.6.2.24	OMC Id	7.6.2.18
Calling number	7.6.2.25	Originally dialled number	7.6.2.26
CAMEL Subscription Info	7.6.3.78	Originating entity number	7.6.2.10
CAMEL Subscription Info Withdraw	7.6.3.38	Override Category	7.6.4.4
Cancellation Type	7.6.3.52	P-TMSI	7.6.2.47
Category	7.6.3.1	PDP-Address	7.6.2.45

CCBS Feature	7.6.5.8	PDP-Context identifier	7.6.3.55
CCBS Request State	7.6.4.49	PDP-Type	7.6.2.44
Channel Type	7.6.5.9	Pre-paging supported	7.6.5.15
Chosen Channel	7.6.5.10	Previous location area Id	7.6.2.4
Ciphering mode	7.6.7.7	Protocol Id	7.6.9.7
Cksn	7.6.7.5	Provider error	7.6.1.3
CLI Restriction	7.6.4.5	QoS-Subscribed	7.6.3.47
CM service type	7.6.9.2	Radio Resource Information	7.6.6.10
Complete Data List Included	7.6.3.54	Rand	7.6.7.2
CS Allocation Retention priority	7.6.3.87	Regional Subscription Data	7.6.3.11
CUG feature	7.6.3.26	Regional Subscription Response	7.6.3.12
CUG index	7.6.3.25	Relocation Number List	7.6.2.19A
CUG info	7.6.3.22	Requested Info	7.6.3.31
CUG interlock	7.6.3.24	Requested Subscription Info	7.6.3.86
CUG Outgoing Access indicator	7.6.3.8	Roaming number	7.6.2.19
CUG subscription	7.6.3.23	Roaming Restricted In SGSN Due To	7.6.3.49
CUG Subscription Flag	7.6.3.37	Unsupported Feature	
Current location area Id	7.6.2.6	Roaming Restriction Due To	7.6.3.13
<u>Current MSC Number</u>	<u>7.6.11.9</u>	Unsupported Feature	
Current password	7.6.4.21	Current Security Context	7.6.7.8
<u>Current SGSN Number</u>	<u>7.6.11.10</u>	Selected RAB ID	7.6.2.56
<u>Deferred MT-LR Data</u>	<u>7.6.11.3</u>	Service centre address	7.6.2.27
<u>Deferred MT-LR Response Indicator</u>	<u>7.6.11.2</u>	Serving Cell Id	7.6.2.37
eMLPP Information	7.6.4.41	SGSN address	7.6.2.39
Encryption Information	7.6.6.9	SGSN CAMEL Subscription Info	7.6.3.75
Equipment status	7.6.3.2	SGSN number	7.6.2.38
Extensible Basic Service Group	7.6.3.5	SIWF Number	7.6.2.35
Extensible Bearer service	7.6.3.3	SoLSA Support Indicator	7.6.3.57
Extensible Call barring feature	7.6.3.21	SM Delivery Outcome	7.6.8.6
Extensible Call barring information	7.6.3.20	SM-RP-DA	7.6.8.1
Extensible Call barring information for CSE	7.6.3.79	SM-RP-MTI	7.6.8.16
Extensible Forwarding feature	7.6.3.16	SM-RP-OA	7.6.8.2
Extensible Forwarding info	7.6.3.15	SM-RP-PRI	7.6.8.5
Extensible Forwarding information for CSE	7.6.3.80	SM-RP-SMEA	7.6.8.17
Extensible Forwarding Options	7.6.3.18	SM-RP-UI	7.6.8.4
Extensible No reply condition timer	7.6.3.19	Sres	7.6.7.3
Extensible QoS-Subscribed	7.6.3.74	SS-Code	7.6.4.1
Extensible SS-Data	7.6.3.29	SS-Data	7.6.4.3
Extensible SS-Info	7.6.3.14	SS-Event	7.6.4.42
Extensible SS-Status	7.6.3.17	SS-Event-Data	7.6.4.43
Extensible Teleservice	7.6.3.4	SS-Info	7.6.4.24
External Signal Information	7.6.9.4	SS-Status	7.6.4.2
Failure Cause	7.6.7.9	Stored location area Id	7.6.2.5
Forwarded-to number	7.6.2.22	Subscriber State	7.6.3.30
Forwarded-to subaddress	7.6.2.23	Subscriber Status	7.6.3.7
Forwarding feature	7.6.4.16	Super-Charger Supported in HLR	7.6.3.70
Forwarding information	7.6.4.15	Super-Charger Supported in Serving	7.6.3.71
Forwarding Options	7.6.4.6	Network Entity	
GGSN address	7.6.2.40	Supported CAMEL Phases in VLR	7.6.3.36
GGSN number	7.6.2.41	Supported CAMEL Phases in SGSN	7.6.3.36A
GMSC CAMEL Subscription Info	7.6.3.34	Supported LCS Capability Sets	7.6.11.17
GPRS enhancements support indicator	7.6.3.73	Suppress T-CSI	7.6.3.33
GPRS Node Indicator	7.6.8.14	Suppression of Announcement	7.6.3.32
GPRS Subscription Data	7.6.3.46	Target cell Id	7.6.2.8
GPRS Subscription Data Withdraw	7.6.3.45	Target location area Id	7.6.2.7
GPRS Support Indicator	7.6.8.15	Target RNC Id	7.6.2.8A
Group Id	7.6.2.33	Target MSC number	7.6.2.12
		Teleservice	7.6.4.39
		TMSI	7.6.2.2

GSM bearer capability	7.6.3.6	Trace reference	7.6.10.2
Guidance information	7.6.4.22	Trace type	7.6.10.3
Handover number	7.6.2.21	User error	7.6.1.4
High Layer Compatibility	7.6.3.43	USSD Data Coding Scheme	7.6.4.36
HLR Id	7.6.2.15	USSD String	7.6.4.37
HLR number	7.6.2.13	UU Data	7.6.5.12
HO-Number Not Required	7.6.6.7	UUS CF Interaction	7.6.5.13
IMEI	7.6.2.3	VBS Data	7.6.3.40
IMSI	7.6.2.1	VGCS Data	7.6.3.39
Integrity Protection Information	7.6.6.8	VLR CAMEL Subscription Info	7.6.3.35
Inter CUG options	7.6.3.27	VLR number	7.6.2.14
Intra CUG restrictions	7.6.3.28	VPLMN address allowed	7.6.3.48
		Zone Code	7.6.2.28

Next Change

7.6.11 Location Service Parameters

7.6.11.1 Age of Location Estimate

This parameter indicates how long ago the location estimate was obtained.

7.6.11.2 ~~Void~~ Deferred MT-LR Response Indicator

This parameter shows that this is a response to a deferred mt-lr request.

7.6.11.3 ~~Void~~ Deferred MT-LR Data

This parameter is used to report the deferred location event type, the location information and reason why the serving node aborted monitoring the event to the GMLC.

7.6.11.4 LCS Client ID

This parameter provides information related to the identity of an LCS client.

7.6.11.5 LCS Event

This parameter identifies an event associated with the triggering of a location estimate.

7.6.11.6 LCS MLC Data

This parameter provides the identities of any authorised GMLCs for a target MS. Only these GMLCs are allowed to send a location request for an external client when location requests are restricted to these GMLCs.

7.6.11.7 LCS Priority

This parameter gives the priority of the location request.

7.6.11.8 LCS QoS

This parameter defines the Quality of Service (QoS) for any location request. It is composed of the following elements.

1) Response Time

Indicates the category of response time – “low delay” or “delay tolerant”.

2) Horizontal Accuracy

Indicates the required horizontal accuracy of the location estimate.

3) Vertical Coordinate

Indicates if a vertical coordinate is required (in addition to horizontal coordinates).

4) Vertical Accuracy

Indicates the required vertical accuracy of the location estimate (inclusion is optional).

7.6.11.9 ~~Void~~ Current MSC Number

This parameter refers to the ISDN number of the MSC currently serving MS. This parameter is set when available in the sending entity and only used for Deffered MT-LR.

7.6.11.10 ~~Void~~ Current SGSN Number

This parameter refers to the ISDN number of the SGSN currently serving MS. This parameter is set when available in the sending entity and only used for Deffered MT-LR.

7.6.11.11 Location Estimate

This parameter gives an estimate of the location of an MS in universal coordinates and the accuracy of the estimate.

7.6.11.12 Location Type

This parameter indicates the type of location estimate required by the LCS client. Possible location estimate types include:

- current location;
- current or last known location;
- initial location for an emergency services call;
- deferred location event type.

7.6.11.13 NA-ESRD

This parameter only applies to location for an emergency services call in North America and gives the North American Emergency Services Routing Digits.

Next Change

13A.2 MAP-PROVIDE-SUBSCRIBER-LOCATION Service

13A.2.1 Definition

This service is used by a GMLC to request the location of a target MS from the visited MSC or SGSN at any time. This is a confirmed service using the primitives from table 13A.2/1.

13A.2.2 Service Primitives

Table 13A.2/1: Provide_Subscriber_Location

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)	M(=)	M(=)

Location Type	M	M(=)		
MLC Number	M	M(=)		
LCS Client ID	M	M(=)		
Privacy Override	U	C(=)		
IMSI	C	C(=)		
MSISDN	C	C(=)		
LMSI	C	C(=)		
LCS Priority	C	C(=)		
LCS QoS	C	C(=)		
IMEI	U	C(=)		
Location Estimate			M	M(=)
Age of Location Estimate			C	C(=)
User error			C	C(=)
<u>Deferred MT-LR Response Indicator</u>			<u>C</u>	<u>C(=)</u>
Provider error				O

13A.2.3 Parameter Definition and Use

All parameters are defined in subclause 7.6. The use of these parameters and the requirements for their presence are specified in 3G TS 23.271

Location Type

This parameter identifies the type of location information requested.

MLC Number

This is the E.164 number of the requesting GMLC.

LCS Client ID

This parameter provides information related to the identity of an LCS client.

Privacy Override

This parameter indicates if MS privacy is overridden by the LCS client when the GMLC and VMSC for an MR-LR are in the same country.

IMSI

The IMSI is provided to identify the target MS. At least one of the IMSI or MSISDN is mandatory.

MSISDN

The MSISDN is provided to identify the target MS. At least one of the IMSI or MSISDN is mandatory.

LMSI

The LMSI shall be provided if previously supplied by the HLR.

LCS Priority

This parameter indicates the priority of the location request.

LCS QoS

This parameter indicates the required quality of service in terms of response time and accuracy.

IMEI

Inclusion of the IMEI is optional.

Location Estimate

This parameter provides the location estimate.

Age of Location Estimate

This parameter indicates how long ago the location estimate was obtained.

Deferred MT-LR Response Indicator

See definition in subclause 7.6.11.2.

User error

This parameter is sent by the responder when the location request has failed or cannot proceed and if present, takes one of the following values defined in subclause 7.6.1.

- System Failure;
- Data Missing;
- Unexpected Data Value;
- Facility Not Supported;
- Unidentified Subscriber;
- Illegal Subscriber;
- Illegal Equipment;
- Absent Subscriber (diagnostic information may also be provided);
- Unauthorised requesting network;
- Unauthorised LCS Client with detailed reason;
- Position method failure with detailed reason.

Provider error

These are defined in subclause 7.6.1.

13A.3 MAP-SUBSCRIBER-LOCATION-REPORT Service

13A.3.1 Definition

This service is used by a VMSC or SGSN to provide the location of a target MS to a GMLC when a request for location is either implicitly administered or made at some earlier time. This is a confirmed service using the primitives from table 13A.3/1.

13A.3.2 Service Primitives

Table 13A.3/1: Subscriber_Location_Report

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)	M(=)	M(=)
LCS Event	M	M(=)		
LCS Client ID	M	M(=)		
Network Node Number	M	M(=)		
IMSI	C	C(=)		
MSISDN	C	C(=)		
NA-ESRD	C	C(=)		
NA-ESRK	C	C(=)		
IMEI	U	C(=)		
Location Estimate	C	C(=)		
Age of Location Estimate	C	C(=)		
LMSI	U	C(=)		

GPRS Node Indicator	C	C(=)		
Deferred MT-LR Data	C	C(=)		
Current MSC Number	C	C(=)		
Current SGSN Number	C	C(=)		
User error			C	C(=)
Provider error				O

13A.3.3 Parameter Definition and Use

All parameters are defined in subclause 7.6. The use of these parameters and the requirements for their presence are specified in 3G TS 23.271

LCS Event

This parameter indicates the event that triggered the Subscriber Location Report.

LCS Client ID

This parameter provides information related to the identity of the recipient LCS client.

Network Node Number

See definition in subclause 7.6.2. This parameter provides the address of the visited MSC or SGSN for target MS.

IMSI

The IMSI shall be provided if available to the VMSC or SGSN.

MSISDN

The MSISDN shall be provided if available to the VMSC or SGSN.

NA-ESRD

If the target MS has originated an emergency service call in North America, the NA-ESRD shall be provided by the VMSC if available.

NA-ESRK

If the target MS has originated an emergency service call in North America, the NA-ESRK shall be provided by the VMSC if assigned.

IMEI

Inclusion of the IMEI is optional.

Location Estimate

This parameter provides the location estimate. The absence of this parameter implies that a location estimate was not available or could not be successfully obtained.

Age of Location Estimate

This parameter indicates how long ago the location estimate was obtained.

LMSI

The LMSI may be provided if assigned by the VLR.

GPRS Node Indicator

See definition in subclause 7.6.8. This presence of this parameter is mandatory if the SGSN number is sent in the Network Node Number.

Deferred MT-LR Data

See definition in subclause 7.6.11.3.

Current MSC Number

See definition in subclause 7.6.11.9.

Current SGSN Number

See definition in subclause 7.6.11.10.

User error

This parameter is sent by the responder when the received message contains an error, cannot be forwarded or stored for an LCS client or cannot be accepted for some other reason and if present, takes one of the following values defined in subclause 7.6.1.

- System Failure;
- Data Missing;
- Unexpected Data Value;
- Resource Limitation;
- Unknown Subscriber;
- Unauthorised requesting network;
- Unknown or unreachable LCS Client.

Provider error

These are defined in subclause 7.6.1.

Next Change

17.7.13 Location service data types

```
MAP-LCS-DataTypes {
    ciitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-LCS-DataTypes (25) version7 (7)}
```

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

```
RoutingInfoForLCS-Arg,
RoutingInfoForLCS-Res,
ProvideSubscriberLocation-Arg,
ProvideSubscriberLocation-Res,
SubscriberLocationReport-Arg,
SubscriberLocationReport-Res,
AlertLCS-Arg,
AlertLCS-Res,
ReportLCS-Status-Arg,
ReportLCS-Status-Res,
InformLCS-Arg,
LocationType,
LCSClientName,
LCS-QoS,
Horizontal-Accuracy,
ResponseTime,
Ext-GeographicalInformation
```

;

```

RoutingInfoForLCS-Arg ::= SEQUENCE {
    mlcNumber                [0] ISDN-AddressString,
    targetMS                 [1] SubscriberIdentity,
    extensionContainer       [2] ExtensionContainer          OPTIONAL,
    ...}

```

```

RoutingInfoForLCS-Res ::= SEQUENCE {
    targetMS                 [0] SubscriberIdentity,
    lcsLocationInfo         [1] LCSLocationInfo,
    extensionContainer       [2] ExtensionContainer          OPTIONAL,
    ...}

```

```

LCSLocationInfo ::= SEQUENCE {
    networkNode-Number      ISDN-AddressString,
    -- NetworkNode-number can be either msc-number or sgsn-number
    lmsi                    [0] LMSI                      OPTIONAL,
    extensionContainer       [1] ExtensionContainer          OPTIONAL,
    ... ,
    gprsNodeIndicator       [2] NULL                      OPTIONAL,
    -- gprsNodeIndicator is set only if the SGSN number is sent as the Network Node Number
    additional-Number       [3] Additional-Number          OPTIONAL
}

```

```

ProvideSubscriberLocation-Arg ::= SEQUENCE {
    locationType            LocationType,
    mlc-Number              ISDN-AddressString,
    lcs-ClientID            [0] LCS-ClientID                OPTIONAL,
    privacyOverride         [1] NULL                      OPTIONAL,
    imsi                   [2] IMSI                      OPTIONAL,
    msisdn                  [3] ISDN-AddressString          OPTIONAL,
    lmsi                    [4] LMSI                      OPTIONAL,
    imei                    [5] IMEI                      OPTIONAL,
    lcs-Priority            [6] LCS-Priority                OPTIONAL,
    lcs-QoS                 [7] LCS-QoS                    OPTIONAL,
    extensionContainer       [8] ExtensionContainer          OPTIONAL,
    ...}

-- one of imsi or msisdn is mandatory

```

```

LocationType ::= SEQUENCE {
    locationEstimateType    [0] LocationEstimateType,
    ... ,
    deferredLocationEventType [1] DeferredLocationEventType OPTIONAL }

```

```

LocationEstimateType ::= ENUMERATED {
    currentLocation         (0),
    currentOrLastKnownLocation (1),
    initialLocation         (2),
    ... ,
    activateDeferredLocation (3),
    cancelDeferredLocation  (4) }

-- exception handling:
-- a ProvideSubscriberLocation-Arg containing an unrecognized LocationEstimateType
-- shall be rejected by the receiver with a return error cause of unexpected data value

```

```

DeferredLocationEventType ::= BIT STRING {
    msAvailable             (0) } (SIZE (1..16))

-- exception handling
-- a ProvideSubscriberLocation-Arg containing other values than listed above in
DeferredLocationEventType shall be rejected by the receiver with a return error cause of
unexpected data value.

```

```

LCS-ClientID ::= SEQUENCE {
    lcsClientType          [0] LCSClientType,
    lcsClientExternalID    [1] LCSClientExternalID          OPTIONAL,
    lcsClientDialedByMS    [2] AddressString                OPTIONAL,
    lcsClientInternalID    [3] LCSClientInternalID          OPTIONAL,
    lcsClientName          [4] LCSClientName                OPTIONAL,
    ... ,
    lcsAPN                 [5] APN                          OPTIONAL }

```

```

LCSClientType ::= ENUMERATED {
    emergencyServices           (0),
    valueAddedServices         (1),
    plmnOperatorServices       (2),
    lawfulInterceptServices    (3),
    ... }
-- exception handling:
-- unrecognized values may be ignored if the LCS client uses the privacy override
-- otherwise, an unrecognized value shall be treated as unexpected data by a receiver
-- a return error shall then be returned if received in a MAP invoke

```

```

LCSClientName ::= SEQUENCE {
    dataCodingScheme           [0] USSD-DataCodingScheme,
    nameString                 [2] NameString,
    ...}
-- The USSD-DataCodingScheme shall indicate use of the default alphabet through the
-- following encoding
-- bit 7 6 5 4 3 2 1 0
--      0 0 0 0 1 1 1 1

```

```

NameString ::= USSD-String (SIZE (1..maxNameStringLength))

```

```

maxNameStringLength INTEGER ::= 63

```

```

LCS-Priority ::= OCTET STRING (SIZE (1))
-- 0 = highest priority
-- 1 = normal priority
-- all other values treated as 1

```

```

LCS-QoS ::= SEQUENCE {
    horizontal-accuracy        [0] Horizontal-Accuracy           OPTIONAL,
    verticalCoordinateRequest  [1] NULL                          OPTIONAL,
    vertical-accuracy          [2] Vertical-Accuracy             OPTIONAL,
    responseTime               [3] ResponseTime                  OPTIONAL,
    extensionContainer         [4] ExtensionContainer             OPTIONAL,
    ...}

```

```

Horizontal-Accuracy ::= OCTET STRING (SIZE (1))
-- bit 8 = 0
-- bits 7-1 = 7 bit Uncertainty Code defined in GSM 03.32. The horizontal location
-- error should be less than the error indicated by the uncertainty code with 67%
-- confidence.

```

```

Vertical-Accuracy ::= OCTET STRING (SIZE (1))
-- bit 8 = 0
-- bits 7-1 = 7 bit Vertical Uncertainty Code defined in GSM 03.32. The vertical location
-- error should be less than the error indicated by the uncertainty code with 67%
-- confidence.

```

```

ResponseTime ::= SEQUENCE {
    responseTimeCategory      ResponseTimeCategory,
    ...}
-- note: an expandable SEQUENCE simplifies later addition of a numeric response time.

```

```

ResponseTimeCategory ::= ENUMERATED {
    lowdelay (0),
    delaytolerant (1),
    ... }
-- exception handling:
-- an unrecognized value shall be treated the same as value 1 (delaytolerant)

```

```

ProvideSubscriberLocation-Res ::= SEQUENCE {
    locationEstimate           Ext-GeographicalInformation,
    ageOfLocationEstimate     [0] AgeOfLocationInformation       OPTIONAL,
    extensionContainer         [1] ExtensionContainer             OPTIONAL,
    ...}
    deferredmt-lrResponseIndicator [2] NULL                      OPTIONAL }
-- if deferredmt-lrResponseIndicator is set, locationEstimate is ignored.

```

```

Ext-GeographicalInformation ::= OCTET STRING (SIZE (1..maxExt-GeographicalInformation))
-- Refers to geographical Information defined in GSM 03.32.
-- This is composed of 1 or more octets with an internal structure according to GSM 03.32
-- Octet 1: Type of shape, only the following shapes in GSM 03.32 are allowed:
--   (a) Ellipsoid point with uncertainty circle
--   (b) Ellipsoid point with uncertainty ellipse
--   (c) Ellipsoid point with altitude and uncertainty ellipsoid
--   (d) Ellipsoid Arc
-- Any other value in octet 1 shall be treated as invalid
-- Octets 2 to 8 for case (a) - Ellipsoid point with uncertainty circle
--   Degrees of Latitude           3 octets
--   Degrees of Longitude          3 octets
--   Uncertainty code              1 octet
-- Octets 2 to 11 for case (b) - Ellipsoid point with uncertainty ellipse:
--   Degrees of Latitude           3 octets
--   Degrees of Longitude          3 octets
--   Uncertainty semi-major axis   1 octet
--   Uncertainty semi-minor axis   1 octet
--   Angle of major axis           1 octet
--   Confidence                     1 octet
-- Octets 2 to 14 for case (c) - Ellipsoid point with altitude and uncertainty ellipsoid
--   Degrees of Latitude           3 octets
--   Degrees of Longitude          3 octets
--   Altitude                       2 octets
--   Uncertainty semi-major axis   1 octet
--   Uncertainty semi-minor axis   1 octet
--   Angle of major axis           1 octet
--   Uncertainty altitude          1 octet
--   Confidence                     1 octet
-- Octets 2 to 13 for case (d) - Ellipsoid Arc
--   Degrees of Latitude           3 octets
--   Degrees of Longitude          3 octets
--   Inner radius                   2 octets
--   Uncertainty radius             1 octet
--   Offset angle                   1 octet
--   Included angle                 1 octet
--   Confidence                     1 octet
--
-- An Ext-GeographicalInformation parameter containing any other shape or an
-- incorrect number of octets or coding according to GSM 03.32 shall be
-- treated as invalid data by a receiver

```

```

maxExt-GeographicalInformation INTEGER ::= 20
-- the maximum length allows for further shapes in GSM 03.32 to be included in later
-- versions of GSM 09.02

```

```

SubscriberLocationReport-Arg ::= SEQUENCE {
  lcs-Event           LCS-Event,
  lcs-ClientID        LCS-ClientID,
  lcsLocationInfo     LCSLocationInfo,
  msisdn              [0] ISDN-AddressString           OPTIONAL,
  imsi                [1] IMSI                         OPTIONAL,
  imei                [2] IMEI                         OPTIONAL,
  na-ESRD             [3] ISDN-AddressString           OPTIONAL,
  na-ESRK             [4] ISDN-AddressString           OPTIONAL,
  locationEstimate    [5] Ext-GeographicalInformation  OPTIONAL,
  ageOfLocationEstimate [6] AgeOfLocationInformation  OPTIONAL,
  extensionContainer   [7] ExtensionContainer          OPTIONAL,
  ...
  deferredmt-lrData   [8] Deferredmt-lrData           OPTIONAL,
  currentmsc-Number   [9] ISDN-AddressString           OPTIONAL,
  currentsgsn-Number [10] ISDN-AddressString           OPTIONAL
}
-- one of msisdn or imsi is mandatory
-- the deferredmt-lrData parameter shall be included if and only if the lcs-Event
-- indicates a deferredmt-lrResponse.

```

```

Deferredmt-lrData ::= SEQUENCE {
  deferredLocationEventType DeferredLocationEventType,
  terminationCause          [0] TerminationCause      OPTIONAL,
  lcsLocationInfo           [1] LCSLocationInfo        OPTIONAL,
  ...
}
-- lcsLocationInfo may be included only if a terminationCause is present
-- indicating mt-lrRestart.

```



```
LCS-Event ::= ENUMERATED {
    emergencyCallOrigination (0),
    emergencyCallRelease (1),
    mo-lr (2),
    .../
    deferredmt-lrResponse (3) }
-- exception handling:
-- a SubscriberLocationReport-Arg containing an unrecognized LCS-Event
-- shall be rejected by a receiver with a return error cause of unexpected data value
```

```
TerminationCause ::= ENUMERATED {
    normal (0),
    errorundefined (1),
    internalTimeout (2),
    congestion (3),
    mt-lrRestart (4),
    privacyViolation (5),
    ... }
-- exception handling
-- an unrecognized value shall be treated the same as value 1 (errorundefined)
```

```
SubscriberLocationReport-Res ::= SEQUENCE {
    extensionContainer ExtensionContainer OPTIONAL,
    ...}
```

END

Next Change

24B Location Service process description

24B.1 Routing information retrieval procedure for LCS

24B.1.1 General

The message flows for successful retrieval of routing information related to location services are shown in figure 24B.1/1.

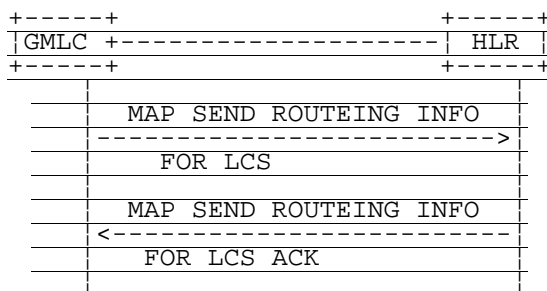


Figure 24B.1/1: Message flow for retrieval of routing information for LCS

The following MAP services are used to retrieve requested information:

MAP SEND ROUTING INFO FOR LCS see subclause 13A.1.

24B.1.2 Process in the GMLC

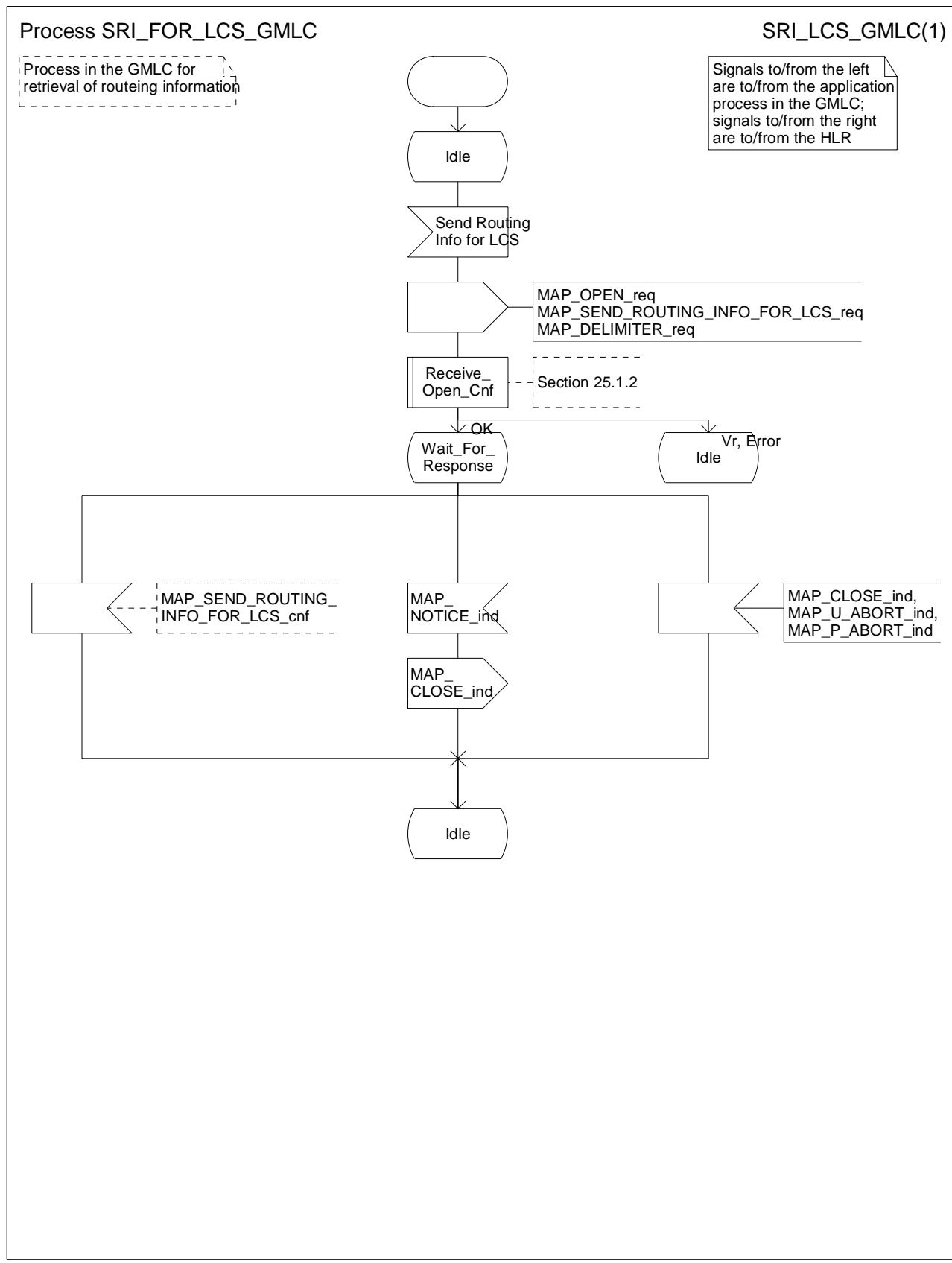


Figure 24B.1/2: Process SRI FOR LCS GMLC

24B.1.3 Process in the HLR

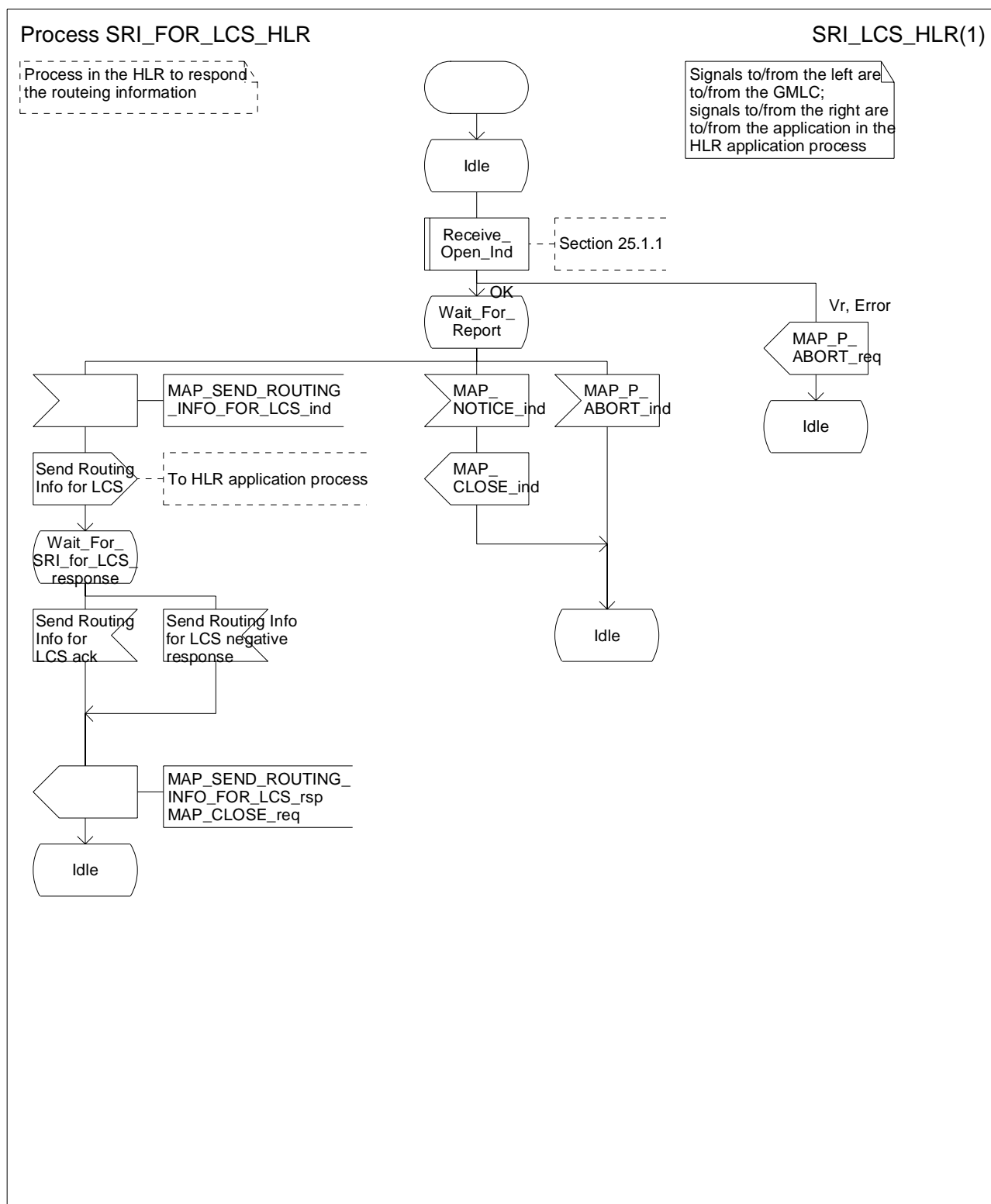


Figure 24B.1/3: Process SRI FOR LCS HLR

24B.2 Provide Subscriber Location procedure

24B.2.1 General

The message flows for successful retrieval of the location information of a target MS related to location services are shown in figure 24B.1/1.

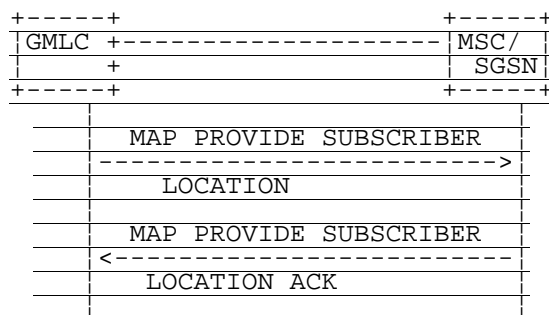


Figure 24B.2/1: Message flow for request of the location information

The following MAP services are used to retrieve requested information:

MAP PROVIDE SUBSCRIBER LOCATION see subclause 13A.2.

24B.2.2 Process in the GMLC

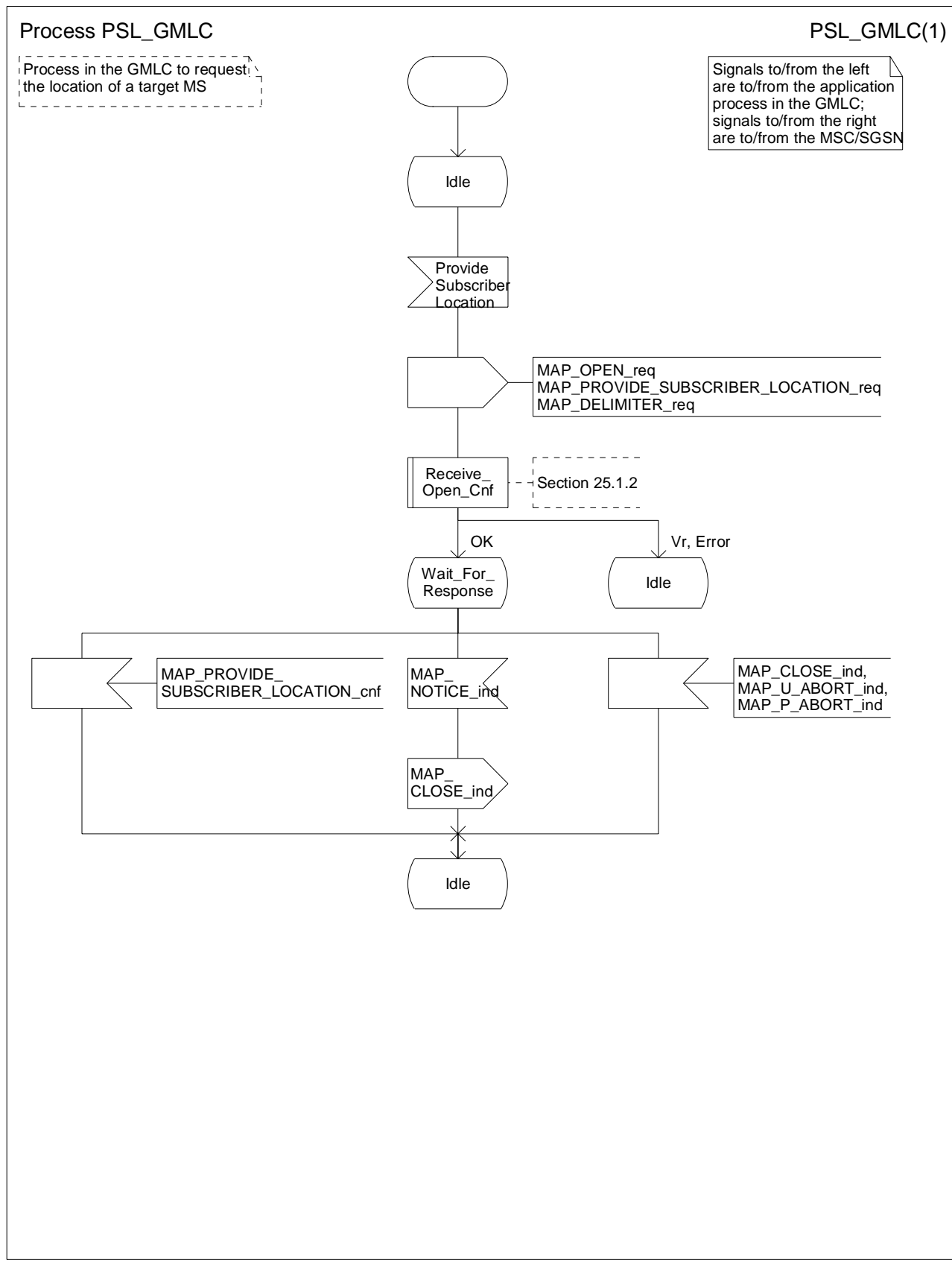


Figure 24B.2/2: Process PSL_GMLC

24B.2.3 Process in the MSC

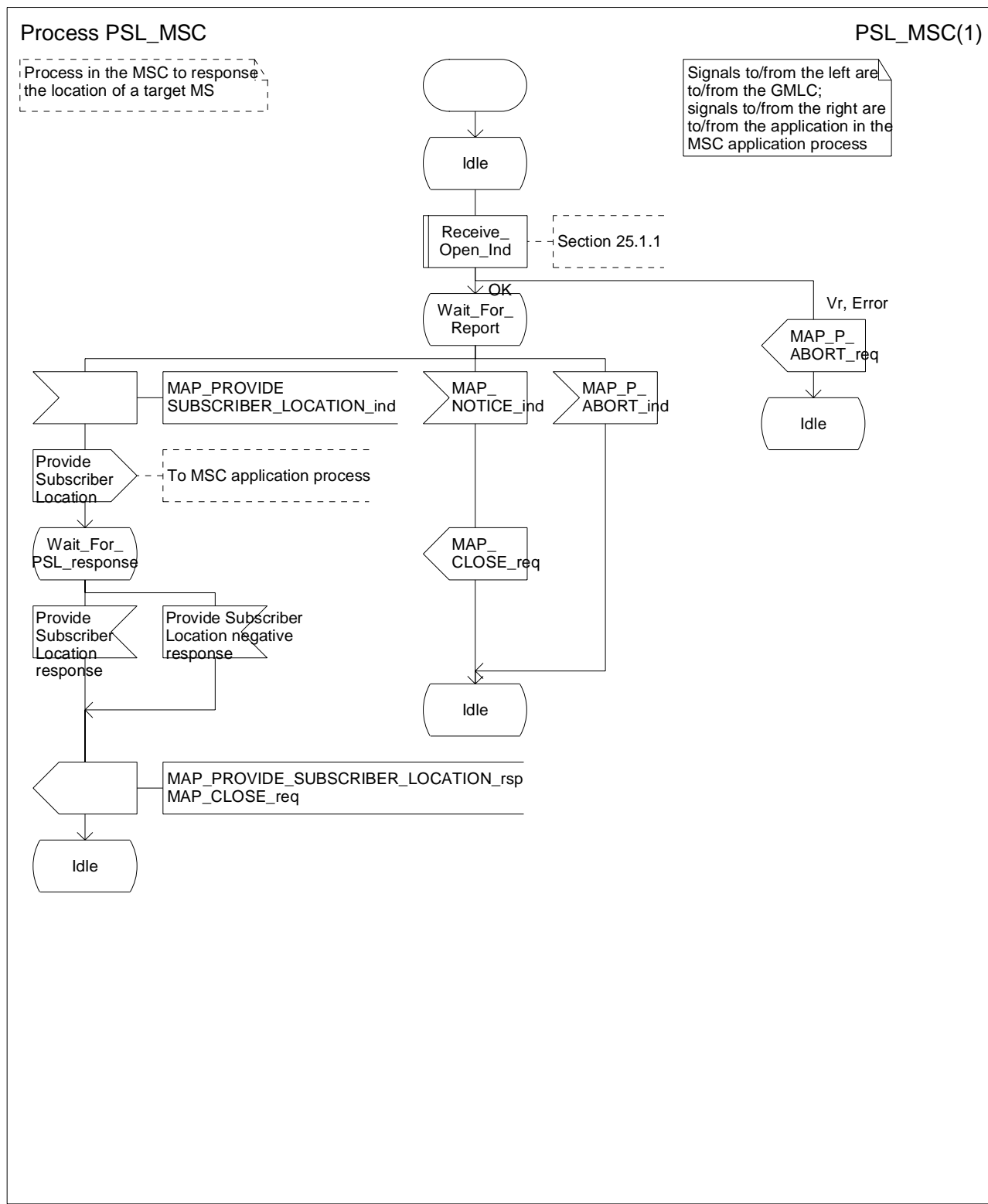


Figure 24B.2/3: Process PSL_MSC

24B.2.4 Process in the SGSN

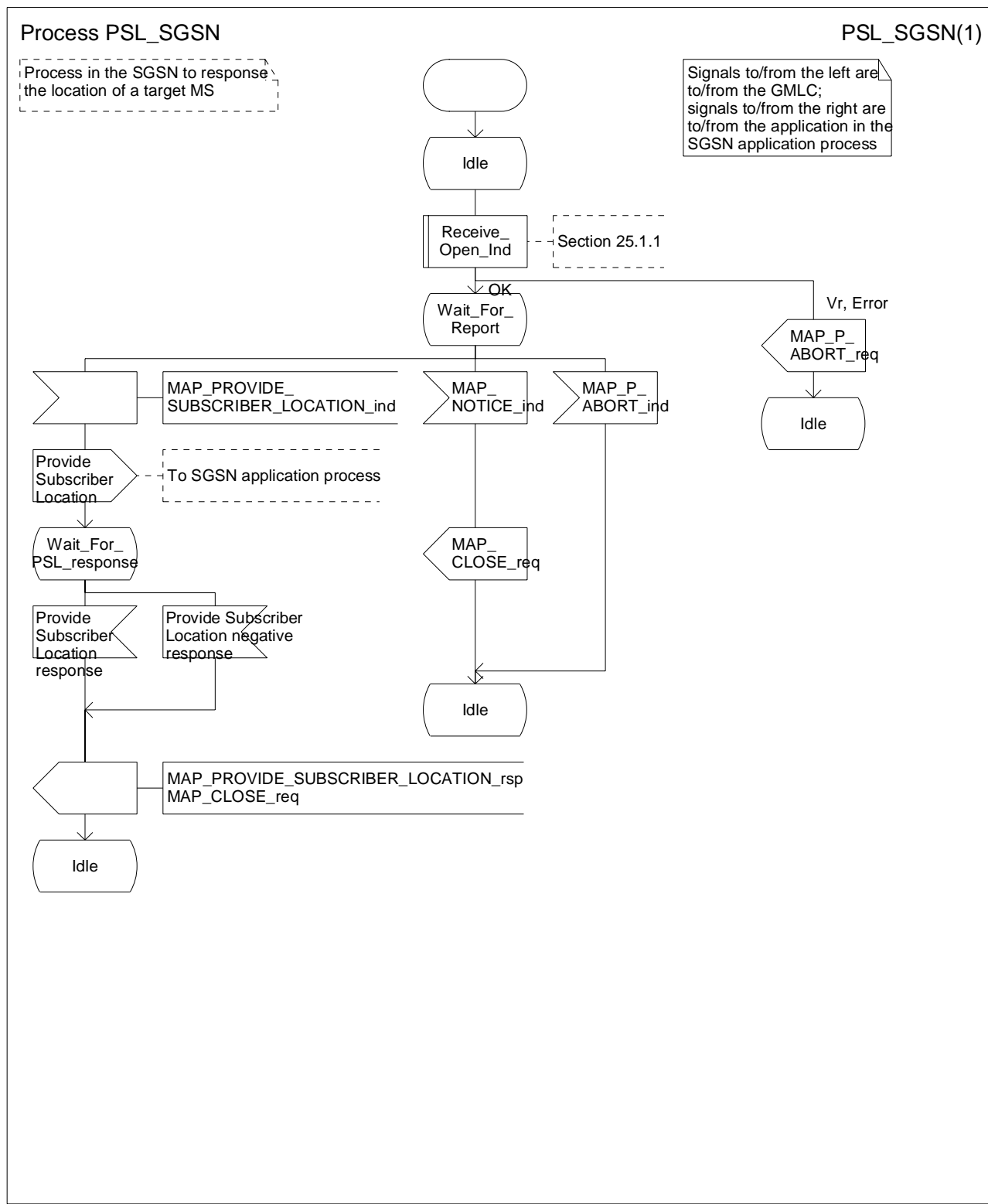


Figure 24B.2/4: Process PSL_SGSN

24B.3 Subscriber Location Report procedure

24B.3.1 General

The message flows for successful report of the location information of a target MS related to location services are shown in figure 24B.3/1.

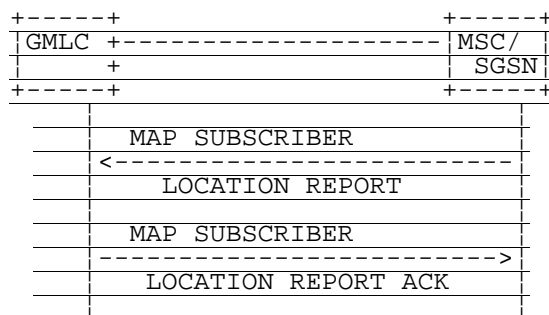


Figure 24B.3/1: Message flow for report of the location information

The following MAP services are used to retrieve requested information:

MAP SUBSCRIBER LOCATION REPORT see subclause 13A.3.

24B.3.2 Process in the GMLC

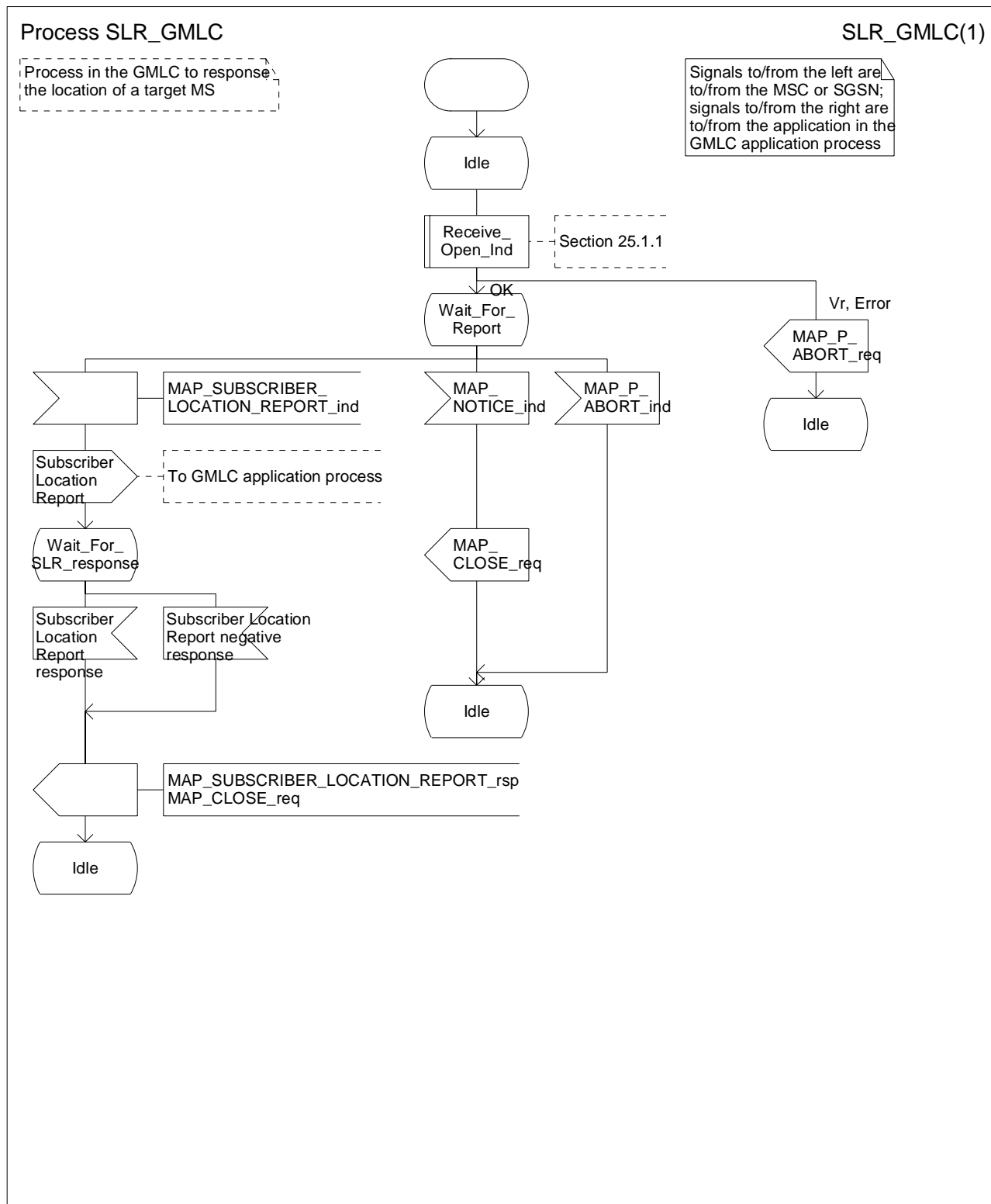


Figure 24B.3/2 Process SLR_GMLC

24B.3.3 Process in the MSC

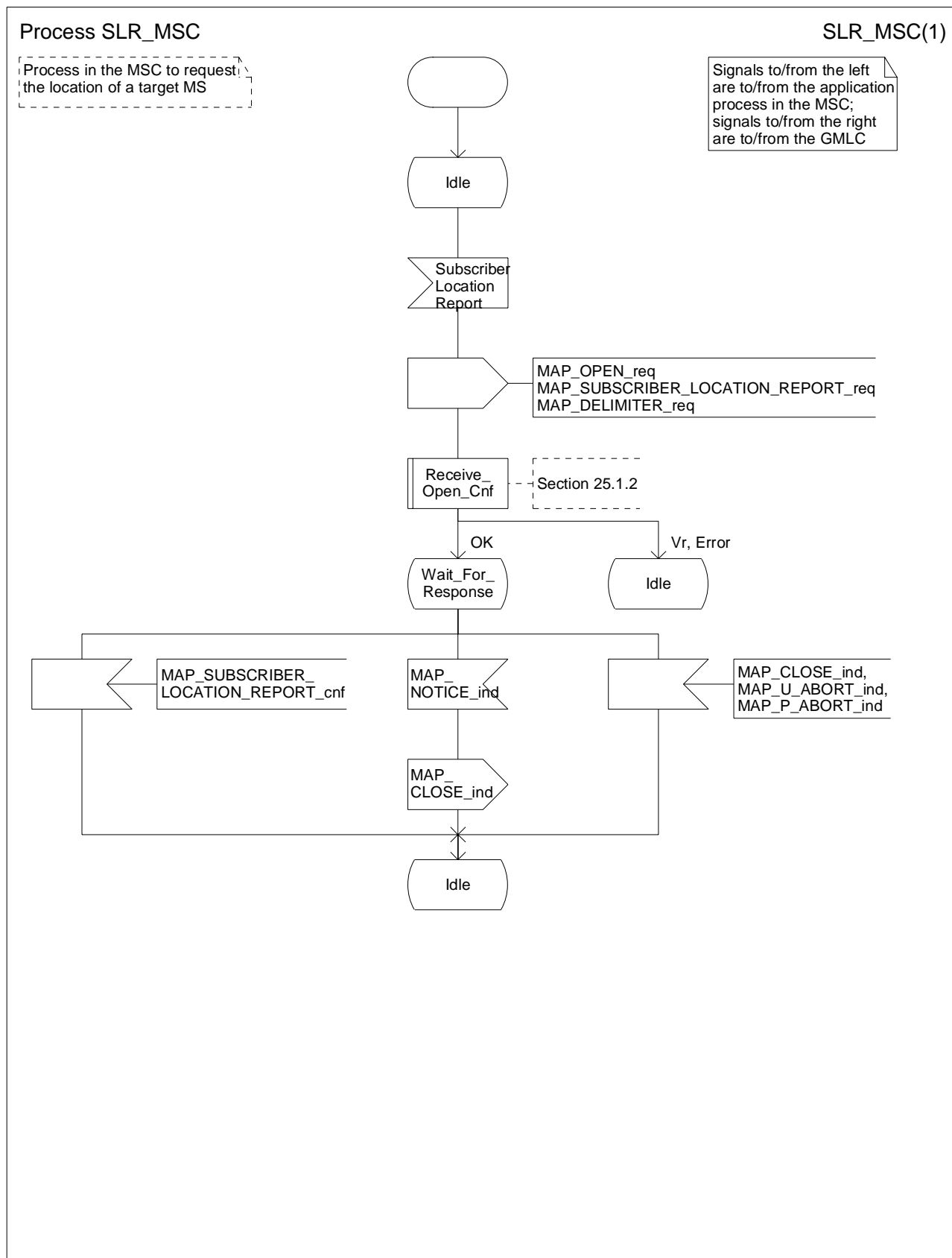


Figure 24B.3/3 Process SLR_MSC

24B.3.4 Process in the SGSN

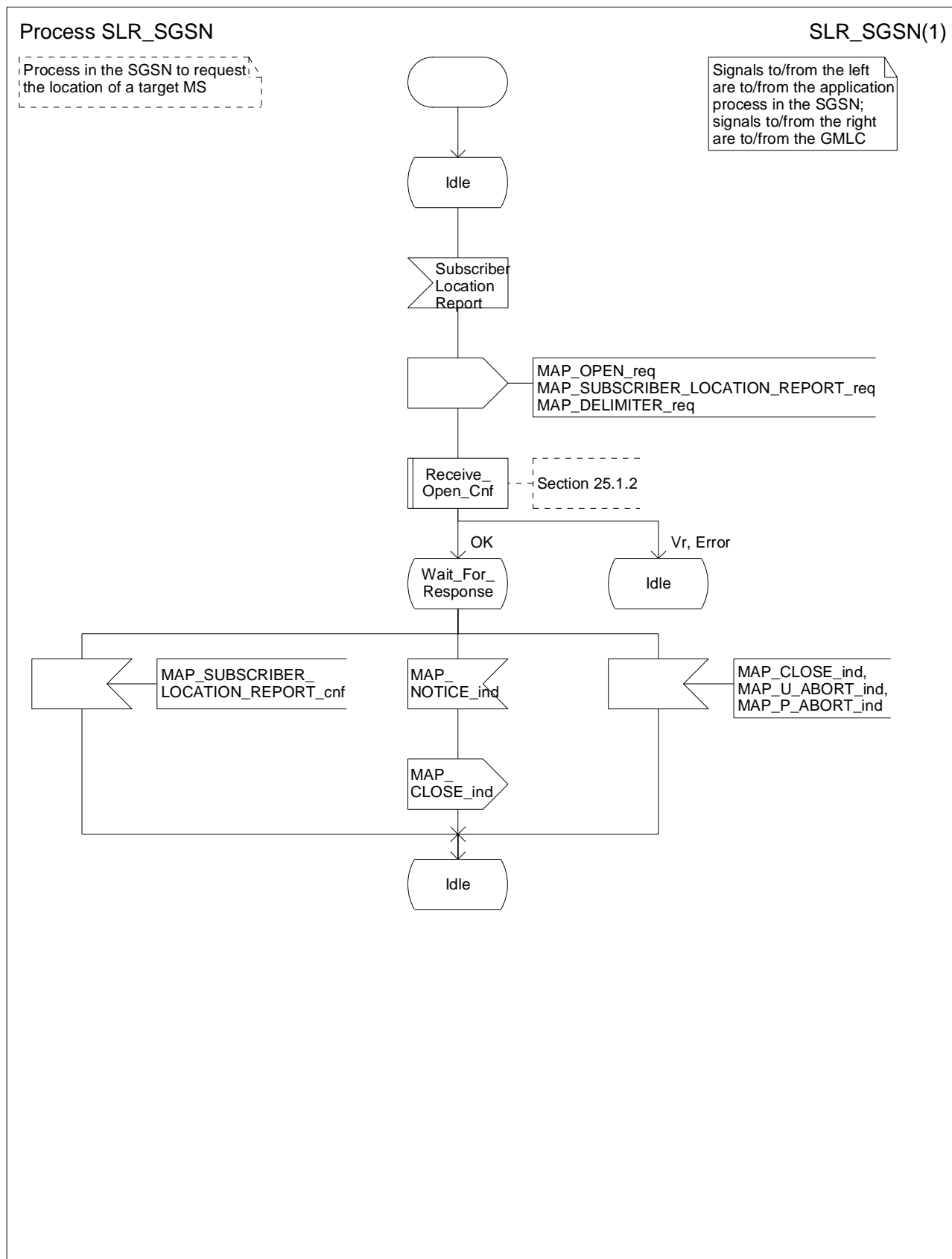


Figure 24B.3/4 Process SLR_SGSN