3GPP TSG CN Plenary **Tdoc NP-010087**
Meeting #11, Palm Springs, U.S.A
14th - 16th March 2001

Source: **TSG CN WG4**

Title: **CRs to Rel-4 on Work Item ODB enhancements**

Agenda item:

Document for: **APPROVAL**

Introduction:

This document contains **4** CRs on **Rel-4** Work Item **"ODB"**, that have been agreed by **TSG CN WG4**, and are forwarded to TSG CN Plenary meeting #11 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.015	002		N4-010012	Rel-4	Add PDP context activation barring scenario, etc	B	3.1.0
23.008	032	1	N4-010195	Rel-4	Declare barring data for ODB PS	B	3.5.0
23.016	017	1	N4-010196	Rel-4	Add three subscriber statuses to the 'ODB Data for GPRS services'	B	3.6.0
29.002	215	2	N4-010276	Rel-4	Add parameters to ISD and SRI for GPRS to handle ODB for PS	B	4.2.1

3GPP TSG-CN4 Meeting *Tdoc N4-010195*
Beijing, China, 15th – 19th January 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.008** **CR** **032** ⌘ 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:	⌘	Declare barring data for ODB PS
Source:	⌘	CN4
Work item code:	⌘	ODB enhancements
Date:	⌘	4th January 2001
Category:	⌘	**B**
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:	⌘	According to the WID of ODB for Packet Oriented Services, this CR expands to apply the ODB feature to the Packet Oriented Services.
Summary of change:	⌘	This CR consists of 2 Changes. 1. In the Section 2.8 Data related to Operator Determined Barring, Barring of Packet Oriented Services is newly created. 2. In the section 4 Table 2: Overview of data used for GPRS Network Access Mode, Newly created data is added.
Consequences if not approved:	⌘	The ODB for Packet Oriented Services cannot be standardised as the Release 4 feature.

Clauses affected:	⌘	2.8.2.8, 4		
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.002, 23.015, 23.016
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.

2.8 Data related to Operator Determined Barring

2.8.1 Subscriber status

Subscriber status is a flag which indicates whether the subscriber is subject to operator determined barring.

It is permanent subscriber data, and is conditionally stored in the HLR, the SGSN and the VLR.

2.8.2 Operator Determined Barring general data

2.8.2.1 Barring of outgoing calls

Barring of outgoing calls indicates which one of the following categories of operator determined barring of outgoing calls applies to the subscriber:

- No barring of outgoing calls;
- Barring of all outgoing calls;
- Barring of all outgoing international calls;
- Barring of all outgoing international calls except those directed to the home PLMN country;
- Barring of all outgoing inter-zonal calls;
- Barring of all outgoing inter-zonal calls except those directed to the home PLMN country;
- Barring of all outgoing international calls except those directed to the home PLMN country AND barring of all outgoing inter-zonal calls.

It is permanent data, and is stored conditionally in the HLR, the SGSN and the VLR.

2.8.2.2 Barring of incoming calls

Barring of incoming calls indicates which one of the following categories of operator determined barring of incoming calls applies to the subscriber:

- No barring of incoming calls;
- Barring of all incoming calls;
- Barring of all incoming calls when roaming outside the home PLMN country;
- Barring of all incoming calls when roaming outside the zone of the home PLMN country.

It is permanent data, and is stored conditionally in the HLR.

2.8.2.3 Barring of roaming

Barring of roaming indicates which one of the following categories of operator determined barring of roaming applies to the subscriber:

- No barring of roaming;
- Barring of roaming outside the home PLMN;
- Barring of roaming outside the home PLMN country.

It is permanent data, and is stored conditionally in the HLR both for non-GPRS and GPRS subscription.

2.8.2.4 Barring of premium rate calls

Barring of premium rate calls indicates which one of the following categories of operator determined barring of premium rate calls applies to the subscriber:

- No barring of premium rate calls;
- Barring of premium rate (information) calls;
- Barring of premium rate (entertainment) calls;
- Barring of premium rate (information) calls and premium rate (entertainment) calls.

It is permanent subscriber data, and is stored conditionally in the HLR and the VLR.

2.8.2.5 Barring of supplementary services management

Barring of supplementary services management is a flag which indicates whether the subscriber is subject to operator determined barring of supplementary services management.

It is permanent subscriber data, and is stored conditionally in the HLR and the VLR.

2.8.2.6 Barring of registration of call forwarding

Barring of registration of call forwarding indicates which one of the following categories of operator determined barring of registration of call forwarding applies to the subscriber:

- Barring of registration of any forwarded-to number;
- Barring of registration of any international forwarded-to number;
- Barring of registration of any international forwarded-to number except a number within the HPLMN country;
- Barring of registration of any inter-zonal forwarded-to number;
- Barring of registration of any inter-zonal forwarded-to number except a number within the HPLMN country.

It is permanent subscriber data, and is stored conditionally in the HLR.

2.8.2.7 Barring of invocation of call transfer

Barring of invocation of call transfer indicates which of the following categories of operator determined barring of invocation of call transfer applies to the subscriber:

One of:

- Barring of invocation of any call transfer;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at international rates;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at inter-zonal rates;

and independently:

- Barring of invocation of call transfer where both calls are calls charged to the served subscriber;

and independently:

- Barring of invocation of call transfer when there is an existing transferred call for the served subscriber in the same MSC/VLR.

It is permanent subscriber data, and is stored conditionally in the HLR and the VLR.

2.8.2.8 Barring of Packet Oriented Services

Barring of Packet Oriented Services indicates which one of the following categories of operator determined barring of Packet Oriented Services applies to the subscriber:

- Barring of all Packet Oriented Services;
- Barring of Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN;
- Barring of Packet Oriented Services from access points that are within the roamed to VPLMN.

2.8.3 Operator Determined Barring PLMN-specific data

Operator determined barring PLMN-specific data indicates which of the following categories of operator specific barring, in any combination, applies to the subscriber:

- Operator specific barring (type 1);
- Operator specific barring (type 2);
- Operator specific barring (type 3);
- Operator specific barring (type 4).

It is permanent subscriber data. It is stored conditionally in the HLR, the SGSN and in the VLR when the subscriber is registered in the home PLMN.

Table 2: Overview of data used for GPRS Network Access Mode

PARAMETER	Subclause	HLR	VLR	SGSN	GGSN	TYPE
IMSI	2.1.1.1	M	M	M	M	P
Network Access Mode	2.1.1.2	M	-	C note1	-	P
International MS ISDN number	2.1.2	M	M	M	-	T
Multinumbering MSISDNs	2.1.3	C	-	-	-	T
Basic MSISDN indicator	2.1.3.1	C	-	-	-	T .
MSISDN-Alert indicator	2.1.3.2	C	-	-	-	T
P-TMSI	2.1.5	-	-	C	-	T
TLLI	2.1.6	-	-	C	-	T
Random TLLI	2.1.7	-	-	C	-	T
IMEI	2.1.9	-	-	C	-	T
RAND/SRES and Kc	2.3.1		-	C	-	T
RAND, XRES, CK, IK, AUTN	2.3.2	M	-	C	-	T
Ciphering Key Sequence Number	2.3.3	-	-	M	-	T
Selected Ciphering Algorithm	2.3.5	-	-	M	-	T
Current Kc	2.3.6	-	-	M	-	T
P-TMSI Signature	2.3.7	-	-	C	-	T
Routing Area Identity	2.4.3	-	-	M	-	T
VLR Number	2.4.5	M	-	C note2	-	T
SGSN Number	2.4.8.1	M	C note2	-	-	T
GGSN Number	2.4.8.2	M	-	-	-	P
RSZI Lists	2.4.11.1	C	-	-	-	P
Zone Code List	2.4.11.2	-	-	C	-	P
LA not allowed flag	2.4.13	-	-	M	-	T
SGSN area restricted flag	2.4.14	M	-	-	-	T
Roaming Restriction in the SGSN ..	2.4.15.2	M	-	M	-	T
Cell Global ID or Service Area ID	2.4.16	-	-	C	-	T
LSA Identity	2.4.17.1	C	C	C	-	P
LSA Priority	2.4.17.2	C	C	C	-	P
LSA Preferential Access Indicator	2.4.17.2A	C	C	C		P
LSA Active Mode Support Indicator	2.$.17.2B	C	C	C		P
LSA Only Access Indicator	2.4.17.3	C	C	C	-	P
LSA Active Mode Indicator	2.4.17.4	C	C	C	-	P
VPLMN Identifier	2.4.17.5	C	-	-	-	P
Provision of teleservice	2.5.2	C	-	C	-	P
Transfer of SM option	2.5.4	M	-	-	-	P
MNRG	2.7.2	M	-	M	M	T
MM State	2.7.3	-	-	M	-	T
Subscriber Data Confirmed by HLR Indicator	2.7.4.2	-	-	M	-	T
Location Info Confirmed by HLR Indicator	2.7.4.3	-	-	M	-	T
MS purged for GPRS flag	2.7.6	M	-	-	-	T
MNRR	2.7.7	C	-	-	-	T
Subscriber Status	2.8.1	C	-	C	-	P
Barring of outgoing calls	2.8.2.1	C	-		-	P
Barring of roaming	2.8.2.3	C	-	C	-	P
Barring of Packet Oriented Services	2.8.2.8	C	-	C	-	P
ODB PLMN-specific data	2.8.3	C	-	C	-	P
Notification to CSE flag for ODB	2.8.4	C	-	-	-	T
GsmSCF address list for ODB	2.8.5	C	-	-	-	P
Trace Activated in SGSN	2.11.7	C	-	C	-	P
PDP Type	2.13.1	C	-	C	M	P
PDP Address	2.13.2	C	-	C	M	P
NSAPI	2.13.3	-	-	C	C	T
PDP State	2.13.4	-	-	C	-	T
New SGSN Address	2.13.5	-	-	C	-	T
Access Point Name	2.13.6	C	-	C	C	P/T
GGSN Address in Use	2.13.7	-	-	C	-	T
VPLMN Address Allowed	2.13.8	C	-	C	-	P
Dynamic Address	2.13.9	-	-	-	C	T
SGSN Address	2.13.10	-	-	-	M	T
GGSN-list	2.13.11	M	-	-	-	T

(continued)

Table 2 (concluded): Overview of data used for GPRS Network Access Mode

PARAMETER	Subclause	HLR	VLR	SGSN	GGSN	TYPE
Quality of Service Subscribed	2.13.12	C	-	C	-	P
Quality of Service Requested	2.13.13	-	-	C	-	T
Quality of Service Negotiated	2.13.14	-	-	C	M	T
SND	2.13.15	-	-	C	C	T
SNU	2.13.16	-	-	C	C	T
DRX Parameters	2.13.17	-	-	M	-	T
Compression	2.13.18	-	-	C	-	T
NGAF	2.13.19	-	-	C note2	-	T
Classmark	2.13.20	-	-	M	-	T
TID	2.13.21	-	-	C	C	T
Radio Priority	2.13.22	-	-	C	-	T
Radio Priority SMS	2.13.23	-	-	C	-	T
PDP Context Identifier	2.13.24	C	-	C	-	T
PDP Context Charging Characteristics	2.13.25	C	-	C	C	P
Short Message Service CAMEL Subscription Information (SMS-CSI)	2.14.4.1/1.8	C	-	C	-	P
GPRS CAMEL Subscription Information (GPRS-CSI)	2.14.4.2/1.9	C	-	C	-	C
SMS-CSI SGSN Negotiated CAMEL Capability Handling	2.14.2.1	C	-	-	-	P
GPRS-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C	-	-	-	P
SGSN Supported CAMEL Phases	2.14.2.3	C	-	-	-	P
GsmSCF address for CSI	2.14.2.4	C	-	-	-	P
Age Indicator	2.16.1	C	-	C	-	T
Subscribed Charging Characteristics	2.19.1	C	-	C	C	P

The HLR column indicates only GPRS related use, i.e. if the HLR uses a parameter in non-GPRS Network Access Mode but not in GPRS Network Access Mode, it is not mentioned in this table 2.

note1: This parameter is relevant in the SGSN only when the Gs interface is installed.

note2: The VLR column is applicable if Gs interface is installed. It only indicates GPRS related data to be stored and is only relevant to GPRS subscribers registered in VLR.

For special condition of storage see in clause 2.
See clause 3 for explanation of M, C, T and P in table 2.

3GPP TSG-CN4 Meeting *Tdoc N4-010012*
Beijing, China, 15th – 19th January 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.015** **CR** **002** ⌘ rev ⌘ Current version: **3.1.0** ⌘

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

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

Title:	⌘	Add PDP context activation barring scenario, etc
Source:	⌘	CN4
Work item code:	⌘	ODB enhancements
Date:	⌘	5th January 2001
Category:	⌘	**B**
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:	⌘	According to the WID of ODB for Packet Oriented Services, this CR expands to apply the ODB feature to the Packet Oriented Services.
Summary of change:	⌘	This CR consists of 5 Changes. 1. Scope of ODB is enhanced to support ODB for Packet Oriented Services. (Section 1) 2. Add ODB realisation about the Barring of MS initiated Packet Oriented Services. (Section 2) 3. Add ODB realisation about the Barring of Network initiated Packet Oriented Services. (Section 2) 4. Add information stored in SGSN due to support the ODB for Packet Oriented Services. (Section 3) 5. Reorganise this entire document since this CR modified many sections; Figure #s are difficult to maintain.
Consequences if not approved:	⌘	The ODB for Packet Oriented Services cannot be standardised as the Release 4 feature.

Clauses affected:	⌘	All		
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.002, 23.008, 23.016
Other comments:	⌘	This CR contains the entire document for the purpose of editorial conveniences.		

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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.

1 Scope

The network feature Operator Determined Barring (ODB) allows a network operator or service provider to regulate access by subscribers to ~~GSM~~ services (both Circuit and Packet Oriented), by the barring of certain categories of incoming or outgoing calls/ Packet Oriented Services~~traffic~~ or of roaming. Operator Determined Barring applies to all bearer services and teleservices except the Emergency Call teleservice; the teleservice Short Message Point-to-Point is therefore subject to Operator Determined Barring in the same way as circuit-switched calls.

The application of specific categories of Operator Determined Barring to a subscription is controlled by the network operator or service provider, using administrative interaction at the HLR; this interface is not standardised.

1.1 Normative references

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] ~~GSM 02~~3G TS 22.041: "Operator Determined Barring".~~41: "Digital cellular telecommunications system (Phase 2+); Operator determined barring".~~

[3] ~~[3]~~ GSM 03.40: "Digital cellular telecommunications system (Phase 2+); Technical realization of the Short Message Service (SMS) Point-to-Point (PP)".

[4] 3G TS 23.060: " General Packet Radio Service (GPRS) Service description Stage 2"

1.2 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

2 Method of realisation

The ~~GSM~~ entities which control the application of Operator Determined Barring (ODB), and the methods used, are described in this clause. Two cases are considered for each type of barring: the effect of administrative action in the HLR to modify the application of the category to a particular subscription, and the effect of the category on the handling of calls or other traffic involving the subscriber.

2.1 Barring of Outgoing Calls or Mobile Originated Short Messages

Barring of outgoing calls or mobile originated short messages includes the categories "outgoing calls" and "outgoing premium rate calls" defined in 3G TS 22.041 [2]~~GSM 02.41~~, and the "operator specific barring" category where this is defined by the PLMN operator to apply to outgoing calls or mobile originated short messages.

2.1.1 Application or Change of Barring in the HLR

If barring of outgoing calls or mobile originated short messages is applied to a subscription (or existing barring of outgoing calls or mobile originated short messages is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly, and transfer the updated subscription information to the VLR and the SGSN using one or more Insert Subscriber Data operations, as shown in figure 2.1.1/1.

If operator specific barring is applied to a subscription (or existing operator specific barring is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly. If the mobile subscriber is registered in the home PLMN, the HLR will transfer the updated subscription information to the VLR and the SGSN using one or more Insert Subscriber Data operations, as shown in figure 2.1.1/1.

If the VPLMN does not support Operator Determined Barring of outgoing calls, the VLR and the SGSN shall indicate this in the acknowledgement of the Insert Subscriber Data message. The HLR shall then, as an operator option, apply the Outgoing Calls Barred supplementary service, apply barring of roaming as described in subclause 2.3 or take any other action decided by the operator of the HPLMN.

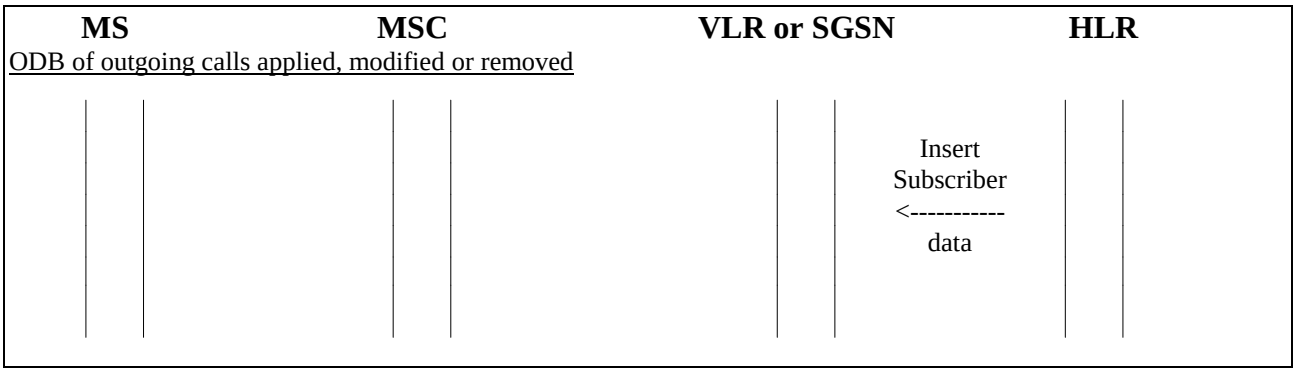


Figure 2.1.1/1: Transfer of updated subscription information to VLR or SGSN

2.1.2 Invocation of Barring

Barring of outgoing calls or mobile originated short messages is invoked in the VLR. If the VLR receives a request for subscription information for an outgoing call or mobile originated short message which is prohibited by Operator Determined Barring, the VLR will return a negative response to the request for subscription information, with an appropriate error indication. The MSC may relay this error indication via the BSS/RNS to the mobile station over the radio path, or (in the case of an outgoing call) may connect the mobile station to an address to be determined by the network operator.

Barring of mobile originated short messages is invoked in the SGSN. If the SGSN receives a request for a mobile originated short message which is prohibited by Operator Determined Barring, the SGSN will return a negative response to the request with an appropriate error indication via the BSS/RNS to the mobile station over the radio path.

Barring of all international calls, barring of all international calls except those directed to the home PLMN country, barring of all premium rate (information) calls or barring of all premium rate (entertainment) calls requires the VLR or the SGSN to analyse the called number to determine whether the requested call is barred.

Barring of all outgoing calls when roaming outside the home PLMN country requires the HLR to determine whether a request for location updating originates from a PLMN outside the home PLMN country. If the request does originate from a PLMN outside the home PLMN country, the HLR will transfer subscription information to the requesting node to indicate that the mobile station is subject to barring of all outgoing calls.

Operator Specific Barring may apply to outgoing or incoming calls, or mobile originated or mobile terminated short messages; if it applies to outgoing calls or mobile originated short messages, it is invoked in the VLR or the SGSN, as described above. If the barring applies to calls directed to a specific class of destination, the called number must be analysed to determine whether the requested call is barred.

Indicative message flow diagrams for the handling of Operator Determined Barring of outgoing calls or mobile originated short messages are given in figures 2.1.2/1~~2a~~ and 2.1.2/2~~b~~. For the case where the mobile station is connected to an address determined by the network operator, this address is assumed to be directly connected to the MSC, so that no inter-MSC signalling is required.

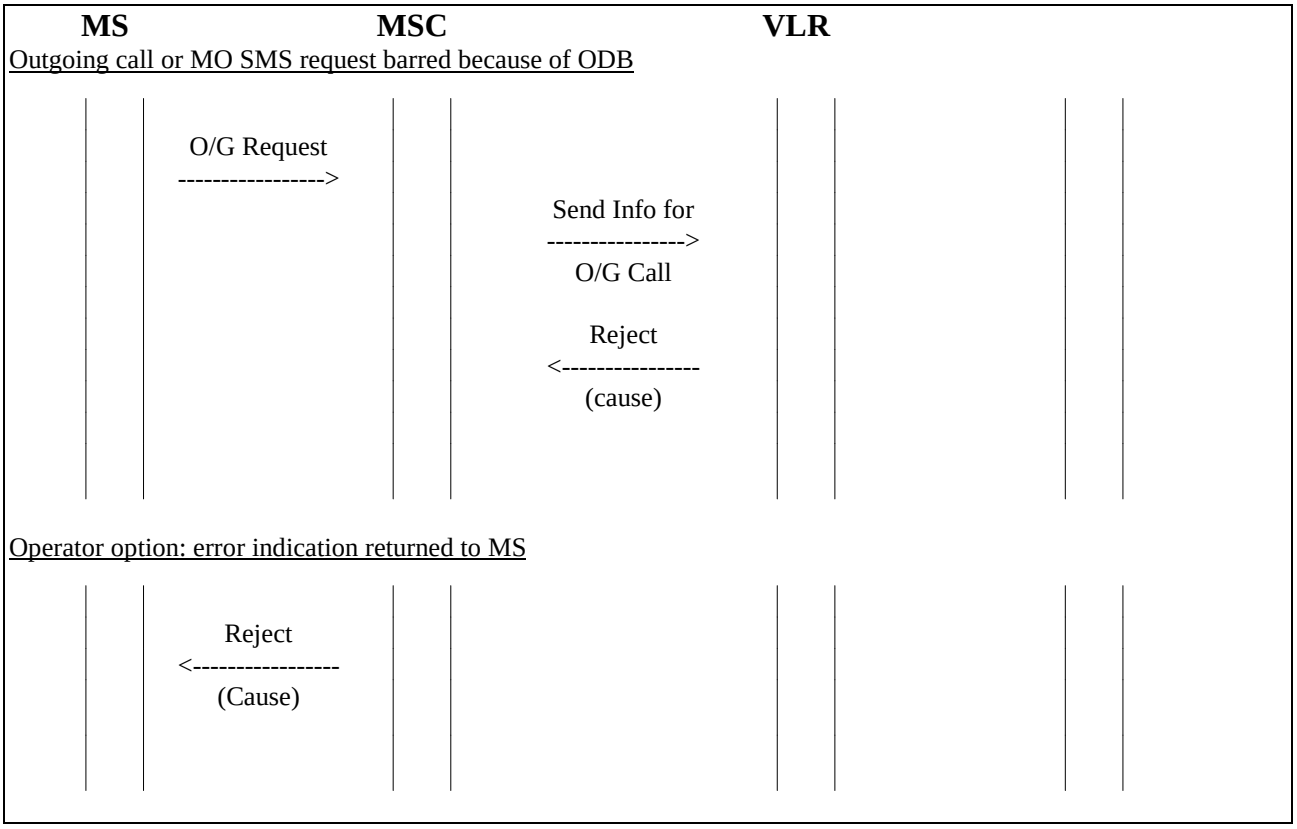


Figure 2.1.2/1a: Operator Determined Barring of Outgoing Calls or Mobile Originated Short Messages invocation in the VLR

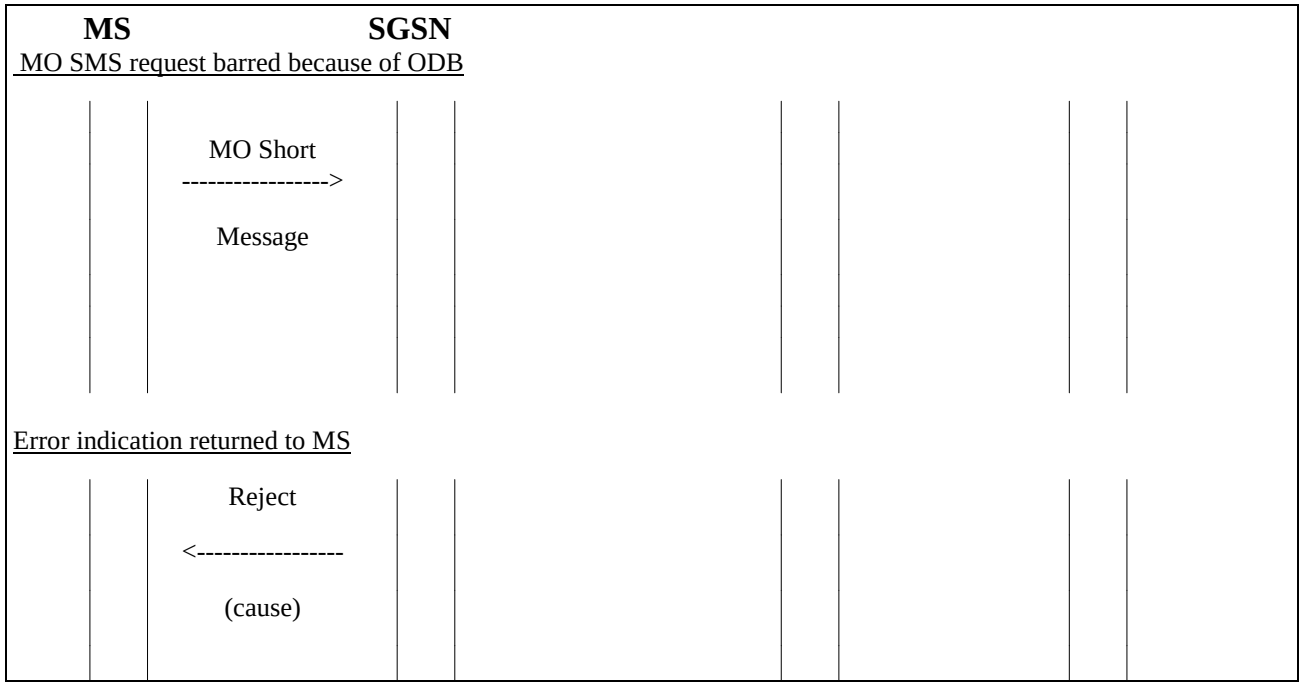


Figure 2.1.2/2b: Operator Determined Barring of Mobile Originated Short Messages invocation in the SGSN

2.2 Barring of Incoming Calls or Mobile Terminated Short Messages

2.2.1 Application or Change of Barring in the HLR

If barring of incoming calls or mobile terminated short messages is applied to a subscription (or existing barring of incoming calls or mobile terminated short messages is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly. It is not necessary to transfer the updated subscription information to the VLR or the SGSN.

2.2.2 Invocation of Barring

Barring of incoming calls is invoked in the HLR. If the HLR receives a request for routing information for a call directed to a mobile station which is subject to barring of incoming calls, the HLR will return a negative response to the request for routing information, with an appropriate error indication. The Gateway MSC may relay this error indication to the originating network using the appropriate telephony signalling system, or may connect the call to a recorded announcement to be determined by the network operator.

Barring of mobile terminated short messages is invoked in the HLR. If the HLR receives a request for routing information for a short message directed to a mobile station which is subject to barring of incoming calls, the HLR will return a negative response to the request for routing information, with an appropriate error indication. This error indication will be relayed to the originating Short Message service centre by the Gateway MSC using the protocol defined in GSM 03.40.

Operator Specific Barring may apply to outgoing or incoming calls, or mobile originated or mobile terminated short messages; if it applies to incoming calls or mobile terminated short messages, it is invoked in the HLR, as described above.

An indicative message flow diagram for the handling of Operator Determined Barring of incoming calls is given in figure 2.2.2/1~~3~~. For the case where the call is connected to an address determined by the network operator, this address is assumed to be directly connected to the GMSC, so that no inter-MSC signalling is required.

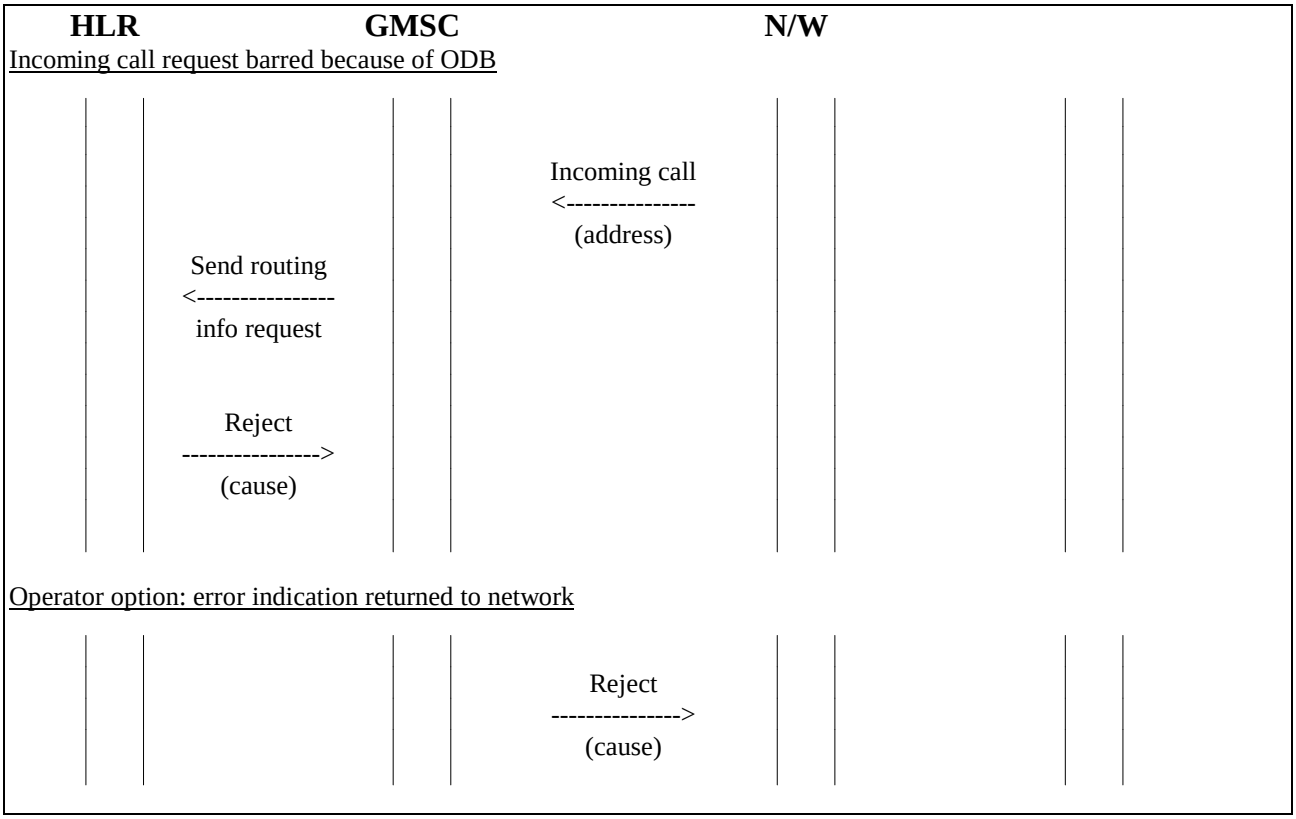


Figure 2.2.2/1~~3~~: Operator Determined Barring of Incoming Calls

An indicative message flow diagram for the handling of Operator Determined Barring of mobile terminated short messages is given in figure 2.2.2/24.

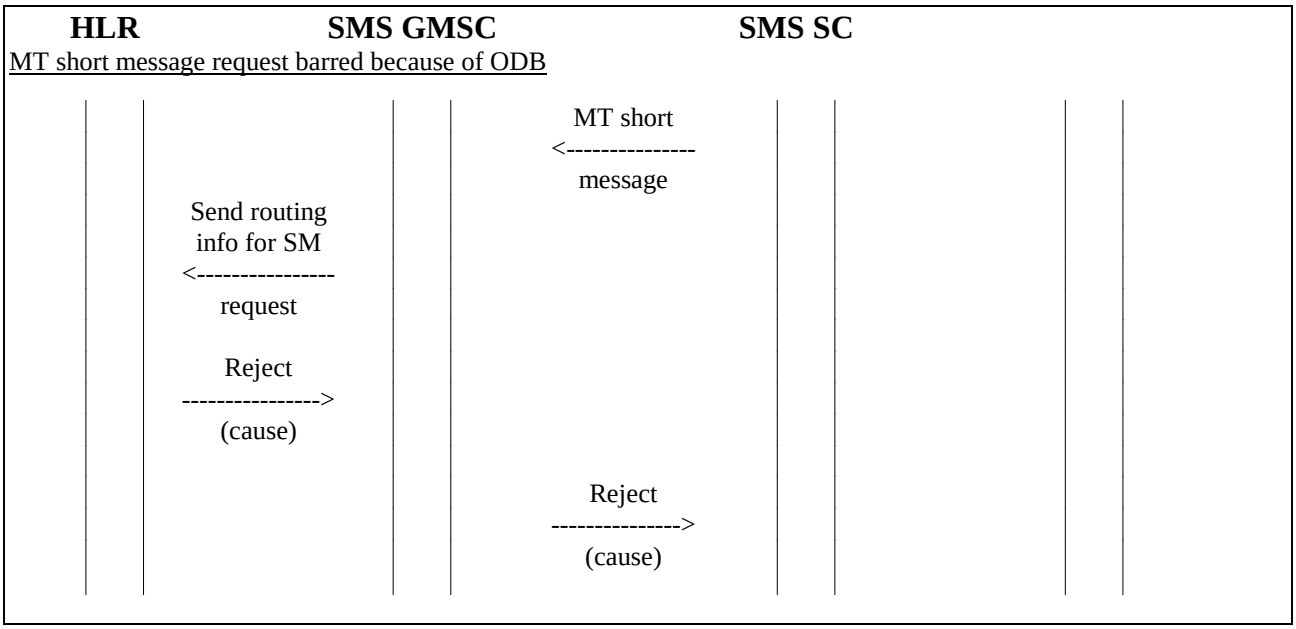


Figure 2.2.2/24: Operator Determined Barring of Mobile Terminated Short Messages

2.3 Barring of Roaming

2.3.1 Application or Change of Barring in the HLR

If barring of roaming is applied to a subscription (or modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly. If the HLR determines from the identity of the VLR and/or the SGSN that the mobile subscriber is currently registered in a barred PLMN, the HLR will put the barring into effect by using a Cancel Location operation to the VLR and/or the SGSN, as shown in figure 2.3.1/15. If the mobile subscriber is not currently registered in a barred PLMN, the HLR will take no further action.

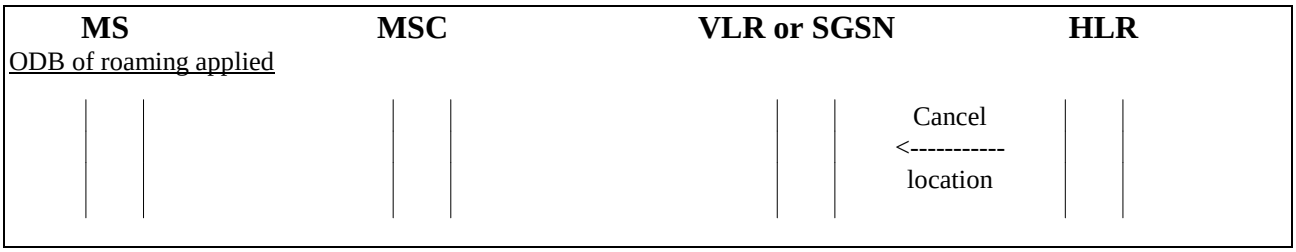


Figure 2.3.1/15: Immediate Application of Barring of Roaming

2.3.2 Invocation of Barring

Barring of roaming is invoked in the HLR. If the HLR receives a request from a VLR for location updating for a mobile which is attempting to roam to an area prohibited by Operator Determined Barring, the HLR will reject the location updating request with an appropriate error indication and this error indication will be relayed by the MSC and the BSS/RNS to the mobile station over the radio path. If the HLR receives a request from a SGSN for location updating for a mobile which is attempting to roam to an area prohibited by Operator Determined Barring, the HLR will reject the location updating request with an appropriate error indication and this error indication will be relayed by the SGSN and the BSS/RNS to the mobile station over the radio path.

Indicative message flow diagrams for the handling of Operator Determined Barring of roaming are given in figures 2.3.2/1~~6a~~ and 2.3.2/2~~6b~~.

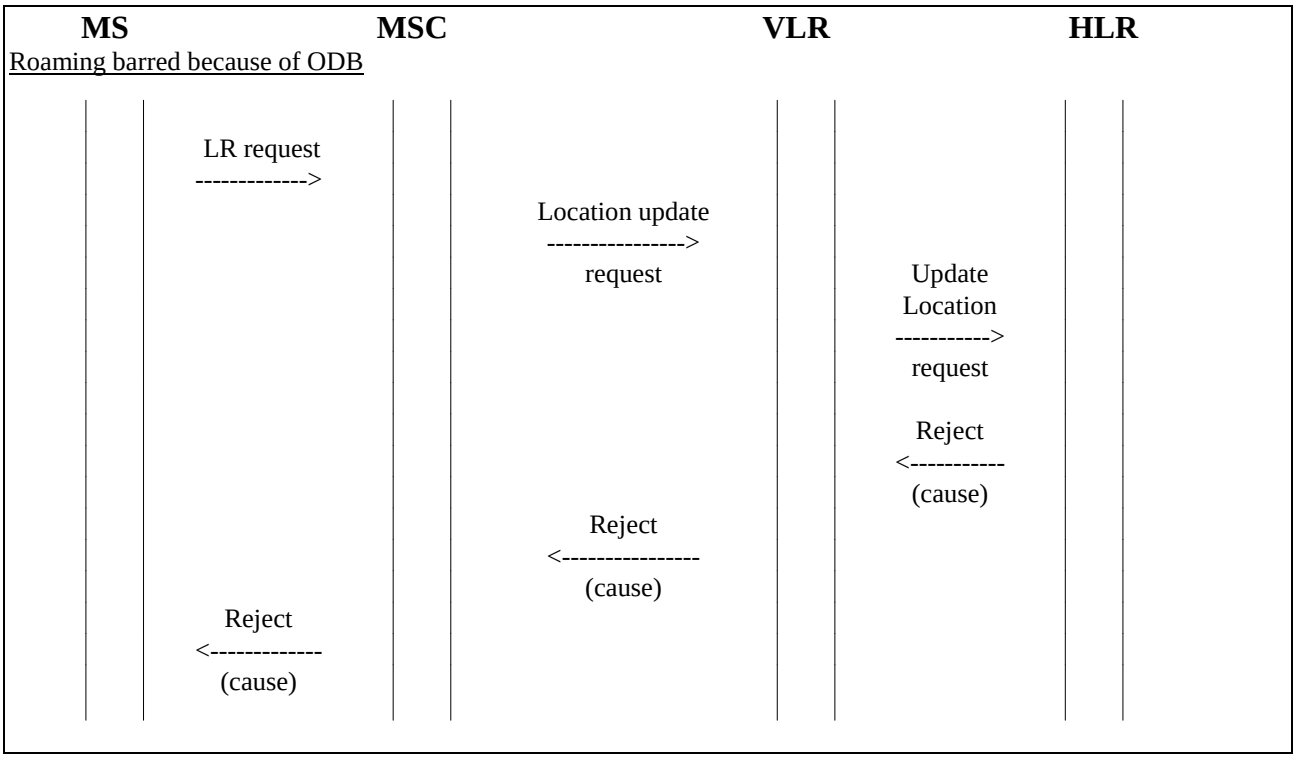


Figure 2.3.2/1~~6a~~: Operator Determined Barring of Roaming invocation in HLR. Roaming in a prohibited VLR

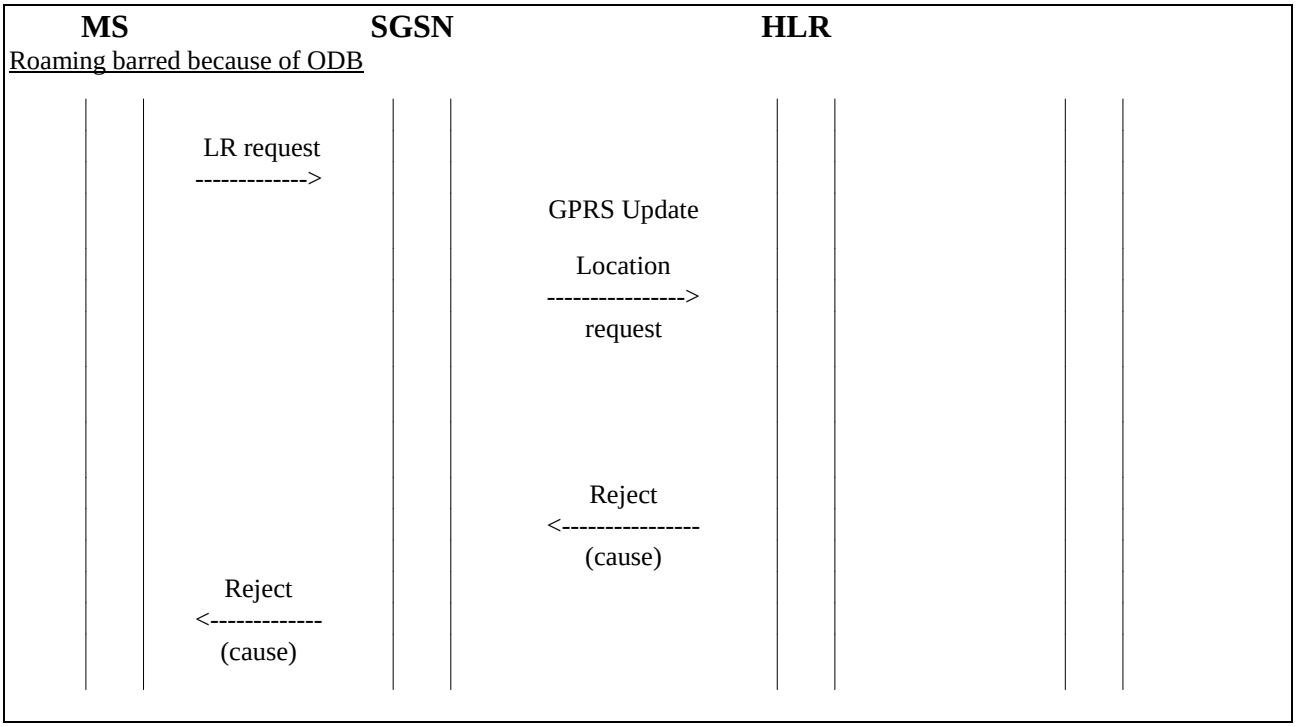


Figure 2.3.2/2~~6b~~: Operator Determined Barring of Roaming invocation in HLR. Roaming in a prohibited SGSN

2.4 Barring of Supplementary Services Access

Barring of supplementary services access encompasses the general barring of supplementary services management category specified in 3G TS 22.041 [2]~~GSM 02.41~~ and the specific categories of barring of registration of a call forwarded-to number and barring of invocation of call transfer.

2.4.1 Application or Change of Barring in the HLR

If barring of supplementary services access is applied to a subscription (or existing barring of supplementary services access is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly, and, if necessary, transfer the updated subscription information to the VLR using one or more Insert Subscriber Data operations, as shown in figure 2.1.1/1.

If the VPLMN does not support Operator Determined Barring of supplementary service access, the VLR shall indicate this in the acknowledgement to the Insert Subscriber Data message. The HLR shall then, as an operator option, apply barring of roaming as described in subclause 2.3 or take any other action decided by the operator of the HPLMN.

2.4.2 Invocation of Barring

Barring of supplementary services access is invoked in the HLR or the VLR, depending on the supplementary service operation.

Barring of access to the following supplementary service operations is invoked in the HLR:

- registration;
- erasure;
- activation;
- deactivation;
- password registration;
- processing unstructured SS data.

An indicative message flow diagram for the handling in the HLR of Operator Determined Barring of access to supplementary services is given in figure 2.4.2/1~~7~~.

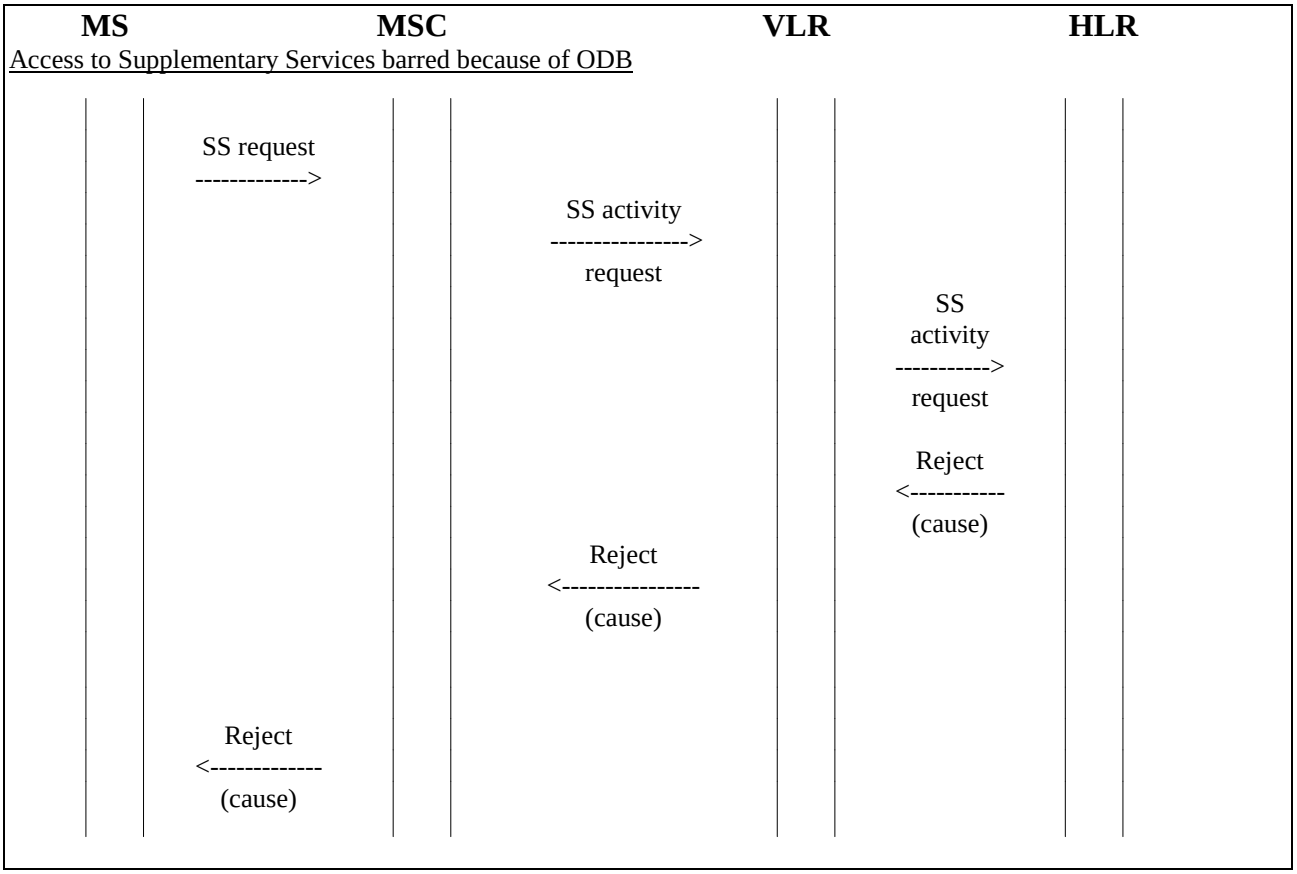


Figure 2.4.2/17: Operator Determined Barring of Access to Supplementary Services in the HLR

NOTE 1: Although the HLR handles interrogation of some supplementary services, Operator Determined Barring of interrogation of all supplementary services is invoked in the VLR. This reduces the amount of analysis which the VLR must perform on supplementary service requests before deciding whether to relay a supplementary service request to the HLR or reject it because of Operator Determined Barring of access to supplementary services. Operator Determined Barring of control of PLMN specific supplementary services is invoked in the VLR for the same reason.

NOTE 2: Although the VLR handles some processing of unstructured SS data, and therefore has to check for Operator Determined Barring of access to supplementary services, a check is also specified in the HLR to guard against the case where the VLR does not support Operator Determined Barring of access to supplementary services.

Barring of access to the following supplementary service operations is invoked in the VLR:

- interrogation;
- invocation;
- control of PLMN specific supplementary services;
- processing unstructured SS data.

An indicative message flow diagram for the handling in the VLR of Operator Determined Barring of access to supplementary services is given in figure 2.4.2/28.

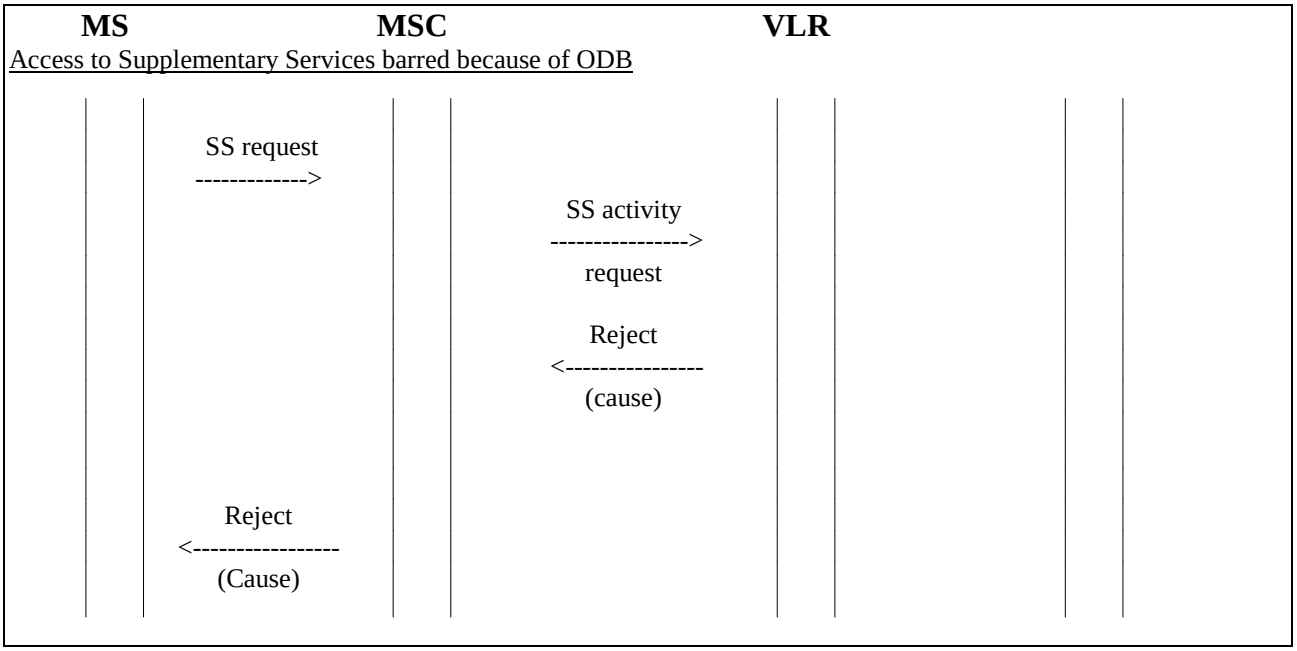


Figure 2.4.2/28: Operator Determined Barring of Access to Supplementary Services in the VLR

2.4.3 Operator Determined Barring of access to supplementary service not supported in VLR

If the VLR does not support Operator Determined Barring of access to supplementary services the HLR shall take the following actions:

The VLR supports only phase 1:

If the HLR receives a request which should normally be barred by the VLR the HLR shall reject the request with the appropriate phase 1 error (illegal SS operation or system failure).

The VLR supports phase 2 but does not support this Operator Determined Barring category:

If the HLR receives a request which should normally be barred by the VLR the HLR shall reject the request instead of the VLR.

Note that requests handled locally by the VLR (e.g. interrogation) will not be barred.

2.5 Barring of MS initiated PDP context activation

Barring of MS initiated PDP context activation shall be performed based on the Operator Determined Barring for Packet Oriented Services defined in 3G TS 22.041 [2].

2.5.1 Application or Change of Barring in the HLR

If barring of Packet Oriented Services is applied to a subscription (or existing barring of Packet Oriented Services is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly, and transfer the updated subscription information to the SGSN using one or more Insert Subscriber Data operations, as shown in figure 2.5.1/1.

If the VPLMN does not support Operator Determined Barring of Packet Oriented Services, the SGSN shall indicate this in the acknowledgement of the Insert Subscriber Data message. The HLR shall then, as an operator option, apply barring of roaming as described in subclause 2.3 or take any other action decided by the operator of the HPLMN.

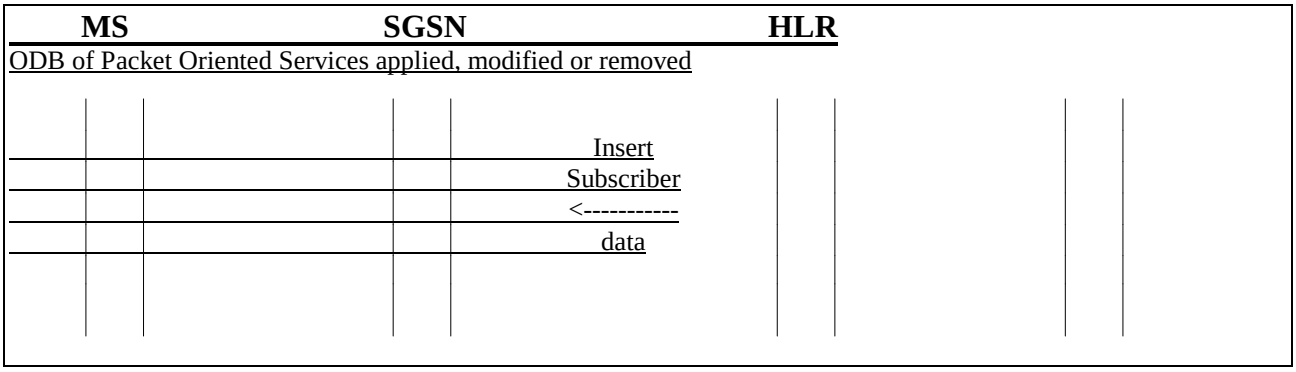


Figure 2.5.1/1: Transfer of updated subscription information to SGSN

2.5.2 Invocation of Barring

Barring of MS initiated PDP context activation is invoked in the SGSN. If the SGSN receives a request for an MS initiated PDP context activation which is prohibited by Operator Determined Barring, the SGSN will return a negative response to the request with an appropriate error indication via the BSS/RNS to the mobile station over the radio path.

Barring of MS initiated PDP context activation is performed in the SGSN while the SGSN selects the APN and GGSN. The APN operator identifier, a part of selected APN is referred to make a judgement whether to be barred or not. The detail mechanism of the ODB judgement is specified in the 3G TS 23.060 [4].

Indicative message flow diagram for the handling of Operator Determined Barring of MS initiated PDP context activation is given in figures 2.5.2/1.

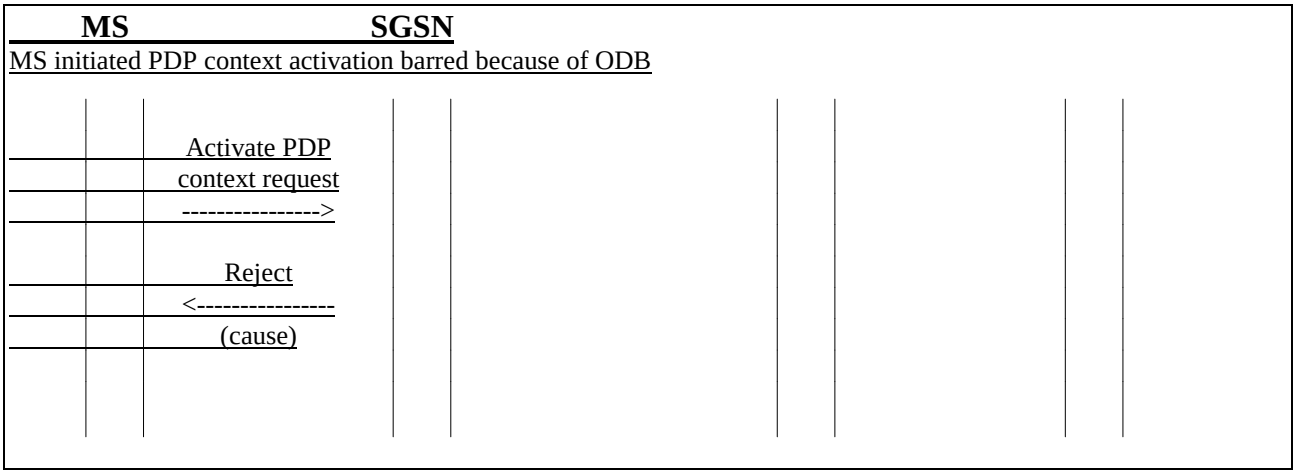


Figure 2.5.2/1: Operator Determined Barring of MS initiated PDP context activation in the SGSN

2.6 Barring of Network initiated PDP context activation

Barring of Network initiated PDP context activation shall be performed based on the Operator Determined Barring for Packet Oriented Services defined in 3G TS 22.041 [2].

2.6.1 Application or Change of Barring in the HLR

If barring of Packet Oriented Services is applied to a subscription (or existing barring of Packet Oriented Services is modified or removed) by administrative action in the HLR, the HLR will update the subscription information accordingly. It is not necessary to transfer the updated subscription information to the SGSN.

2.6.2 Invocation of Barring

Barring of Network initiated PDP context activation is invoked in the HLR. If the HLR receives a request for routing information for a PDP context activation directed to a mobile station which is subject to barring of Packet Oriented Services, the HLR will return a negative response to the request for routing information, with an appropriate error indication. The GGSN may relay this error indication to the PDP PDU incoming network using the appropriate interworking.

An indicative message flow diagram for the handling of Operator Determined Barring of Network initiated PDP context activation is given in figure 2.6.2/1.

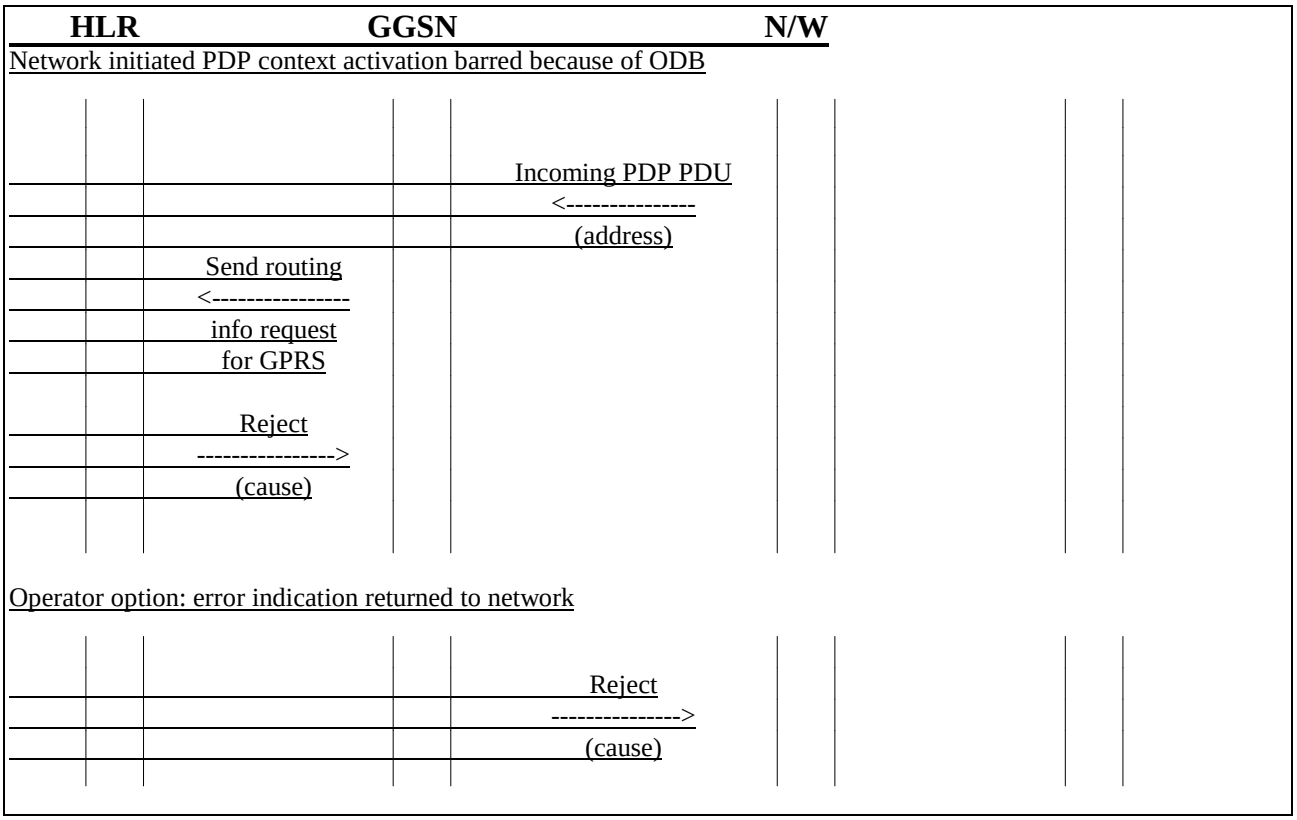


Figure 2.6.2/1: Operator Determined Barring of Network initiated PDP context activation

2.~~5~~7 Interactions of Operator Determined Barring with Supplementary Services

The following interactions of Operator Determined Barring with supplementary services have been identified:

2.7~~5~~.1 Call Forwarding

The interactions between Operator Determined Barring and Call Forwarding are specified in 3G TS 22.041 [2]~~GSM 02.41~~.

The interaction where Operator Determined Barring is applied when there is an existing Call Forwarding programme which is in contravention of the Operator Determined Barring programme is shown in the message flow diagram in figure ~~9~~2.7.1/1. The HLR modifies the subscription information for the mobile subscriber to show that the contravening call forwarding programme is quiescent, and forwards the modified subscription information to the VLR. No indication is forwarded to the mobile station or the user.

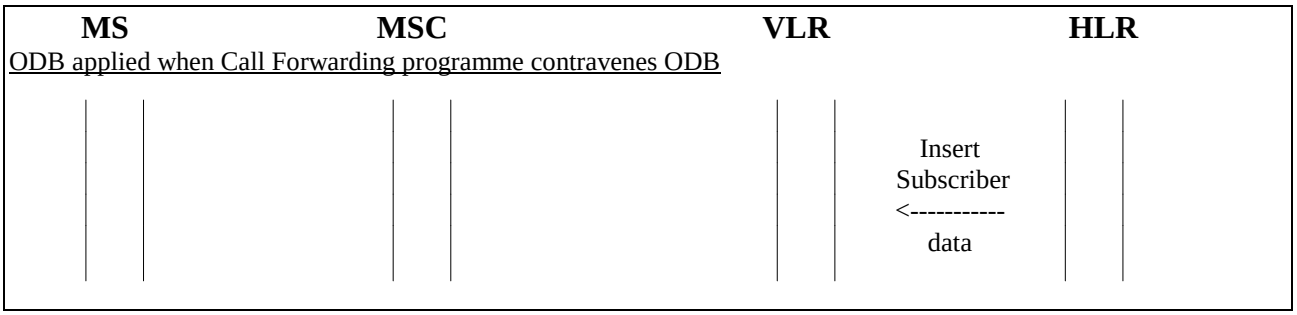


Figure 2.7.1/1~~9~~: Effect of Operator Determined Barring on Call Forwarding programme

The interaction where the user attempts to activate or register a call forwarding programme which is in contravention of an operator determined barring category is shown in the message flow diagram in figure ~~10~~2.7.1/2.

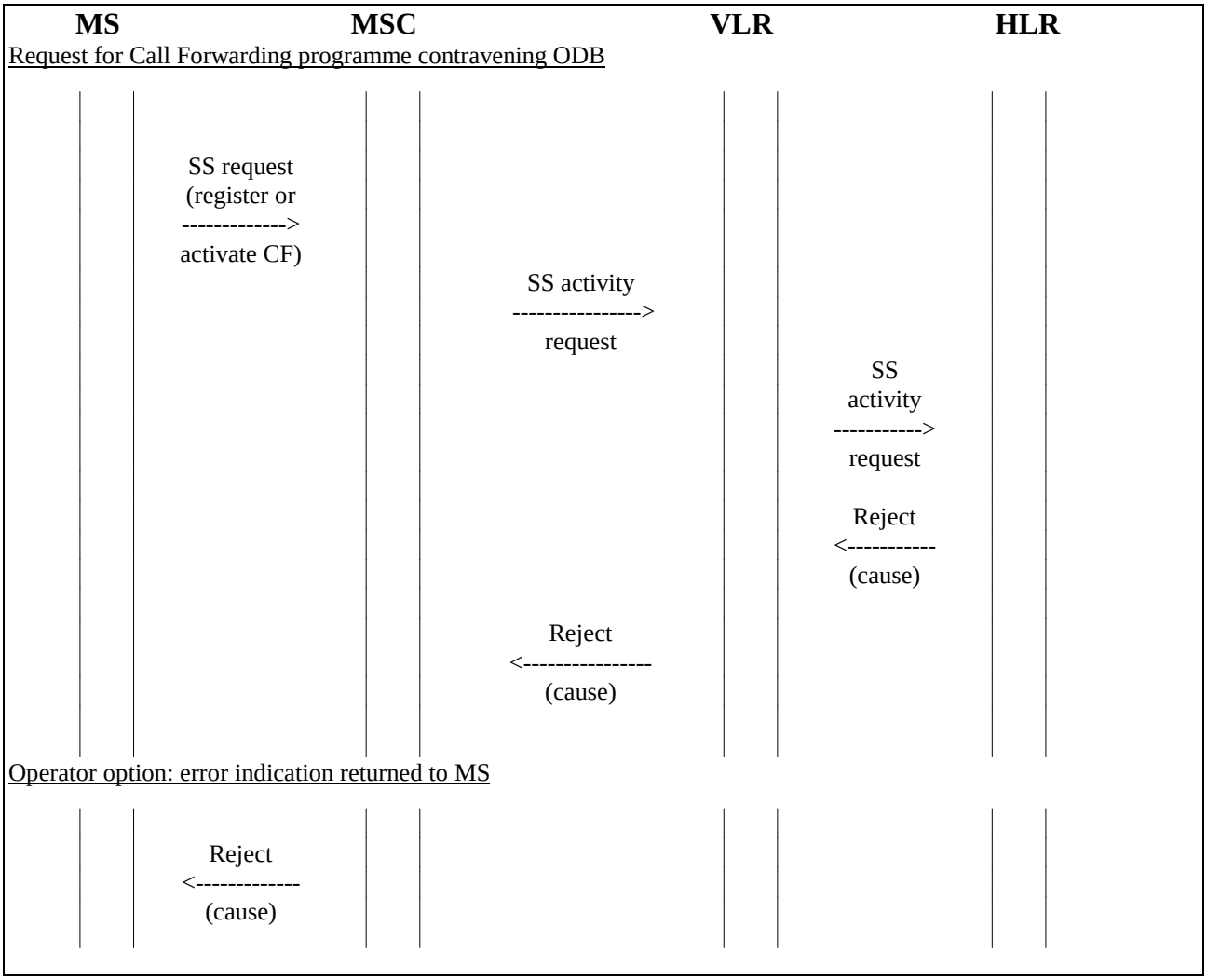


Figure ~~10~~2.7.1/2: Interaction between Operator Determined Barring and Call Forwarding

2.~~5~~7.2 Closed User Group

The interaction between Operator Determined Barring and Closed User Group is specified in 3G TS 22.041 [2]~~GSM 02.41~~. In order to meet the service requirement, the checks of a call request in the HLR (for incoming calls) or VLR (for outgoing calls) against the Operator Determined Barring programme shall be carried out before the checks for Closed User Group.

2.~~5~~7.3 Call Barring

The interaction between Operator Determined Barring and the Call Barring supplementary service is specified in 3G TS 22.041 [2].~~GSM 02.41.~~ In order to meet the service requirement, the checks of a call request in the HLR (for incoming calls) or VLR (for outgoing calls) against the Operator Determined Barring programme shall be carried out before the checks for the Call Barring supplementary service.

3 Information stored in location registers

3.1 Information stored in the HLR

The HLR must store subscription information for each mobile subscriber to define which of the following categories of barring is to be applied, independently of each other:

Barring of outgoing calls (including mobile originated short messages) - one of:

- Barring of all outgoing calls;
- Barring of all outgoing international calls;
- Barring of all outgoing international calls except those directed to the home PLMN country;
- Barring of all outgoing calls when roaming outside the home PLMN country;
- Barring of all outgoing inter-zonal calls;
- Barring of all outgoing inter-zonal calls except those directed to the home PLMN country;
- Barring of all outgoing international calls except those directed to the home PLMN country AND barring of all outgoing inter-zonal calls.

Barring of incoming calls (including mobile terminated short messages) - one of:

- Barring of all incoming calls;
- Barring of all incoming calls when roaming outside the home PLMN country;
- Barring of all incoming calls when roaming outside the zone of the home PLMN country.

Barring of roaming - one of:

- Barring of roaming outside the home PLMN;
- Barring of roaming outside the home PLMN country.

Barring of outgoing premium rate calls - one or both of:

- Barring of outgoing premium rate (information) calls;
- Barring of outgoing premium rate (entertainment) calls.

Barring specific to the home PLMN - when the mobile station is registered in its home PLMN, any one or more of:

- Operator Specific Barring (Type 1);
- Operator Specific Barring (Type 2);
- Operator Specific Barring (Type 3);
- Operator Specific Barring (Type 4).

Barring of Supplementary Services Management.

Barring of registration of call forwarding - one of:

- Barring of registration of any forwarded-to number;
- Barring of registration of any international forwarded-to number;
- Barring of registration of any international forwarded-to number except a number within the HPLMN country;
- Barring of registration of any inter-zonal forwarded-to number;
- Barring of registration of any inter-zonal forwarded-to number except a number within the HPLMN country.

Barring of invocation of call transfer:

one of:

- Barring of invocation of any call transfer;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber;

- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at international rates, i.e. the call is either an outgoing international call or an incoming call when the served subscriber roams outside the HPLMN country;

- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at inter-zonal rates, i.e. the call is either an outgoing inter-zonal call or an incoming call when the served subscriber roams to a VPLMN in a different zone from the HPLMN;

and independently:

- Barring of invocation of call transfer where both calls are calls charged to the served subscriber;

and independently:

- Barring of invocation of call transfer when there is an existing transferred call for the served subscriber in the same MSC/VLR.

Barring of Packet Oriented Services - one of:

- Barring of all Packet Oriented Services;

- Barring of Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN;

- Barring of Packet Oriented Services from access points that are within the roamed to VPLMN.

3.2 Information stored in the VLR

The VLR must store subscription information for each mobile subscriber to define which of the following categories of barring is to be applied, independently of each other:

Barring of outgoing calls (including mobile originated short messages) - one of:

- Barring of all outgoing calls;

- Barring of all outgoing international calls;

- Barring of all outgoing international calls except those directed to the home PLMN country;

- Barring of all outgoing inter-zonal calls;

- Barring of all outgoing inter-zonal calls except those directed to the home PLMN country;

- Barring of all outgoing international calls except those directed to the home PLMN country AND barring of all outgoing inter-zonal calls.

Barring of outgoing premium rate calls - one or both of:

- Barring of outgoing premium rate (information) calls;

- Barring of outgoing premium rate (entertainment) calls.

Barring specific to the home PLMN - when the mobile station is registered in its home PLMN, any one or more of:

- Operator Specific Barring (Type 1);

- Operator Specific Barring (Type 2);

- Operator Specific Barring (Type 3);

- Operator Specific Barring (Type 4).

Barring of Supplementary Services Management.

Barring of invocation of call transfer:

one of:

- Barring of invocation of any call transfer;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at international rates, i.e. the call is either an outgoing international call or an incoming call when the served subscriber roams outside the HPLMN country;
- Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at inter-zonal rates, i.e. the call is either an outgoing inter-zonal call or an incoming call when the served subscriber roams to a VPLMN in a different zone from the HPLMN.

and independently:

- Barring of invocation of call transfer where both calls are calls charged to the served subscriber;

and independently:

- Barring of invocation of call transfer when there is an existing transferred call for the served subscriber in the same MSC/VLR.

3.3 Information stored in the SGSN

The SGSN must store subscription information for each mobile subscriber to define which of the following categories of barring is to be applied, independently of each other:

Barring of mobile originated short messages - one of:

- Barring of all outgoing calls;
- Barring of all outgoing international calls;
- Barring of all outgoing international calls except those directed to the home PLMN country;
- Barring of all outgoing inter-zonal calls;
- Barring of all outgoing inter-zonal calls except those directed to the home PLMN country;
- Barring of all outgoing international calls except those directed to the home PLMN country AND barring of all outgoing inter-zonal calls.

Barring specific to the home PLMN of mobile originated short messages - when the mobile station is registered in its home PLMN, any one or more of:

- Operator Specific Barring (Type 1);
- Operator Specific Barring (Type 2);
- Operator Specific Barring (Type 3);
- Operator Specific Barring (Type 4).

Barring of Packet Oriented Services - one of:

- Barring of all Packet Oriented Services;
- Barring of Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN;
- Barring of Packet Oriented Services from access points that are within the roamed to VPLMN.

3.4 Transfer of Subscription Information from HLR to VLR

The following subscription information for Operator Determined Barring must be transferred from the HLR to the VLR when a mobile station registers in a VLR:

- Barring of outgoing calls;
- Barring of outgoing premium rate calls;
- Barring of supplementary services management;
- Barring of invocation of call transfer.

In addition, when a mobile station registers in a VLR in its home PLMN the subscription information for Operator Determined Barring specific to the home PLMN must be transferred from the HLR to the VLR.

3.5 Transfer of Subscription Information from HLR to SGSN

The following subscription information for Operator Determined Barring must be transferred from the HLR to the SGSN when a mobile station registers in a SGSN:

- ~~Barring of outgoing calls (which leads to barring of mobile originated short messages).~~

The following subscription information for Operator Determined Barring for Packet Oriented Services must be transferred from the HLR to the SGSN when a mobile station registers in a SGSN:

- Barring of all Packet Oriented Services;
- Barring of Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN;
- Barring of Packet Oriented Services from access points that are within the roamed to VPLMN.

In addition, when a mobile station registers in a SGSN in its home PLMN the subscription information for Operator Determined Barring specific to the home PLMN must be transferred from the HLR to the SGSN.

3GPP TSG-CN4 Meeting *Tdoc N4-010196*
Beijing, China, 15th – 19th January 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.016** **CR** **017** ⌘ rev **1** ⌘ Current version: **3.6.0** ⌘

*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:	⌘	Add three subscriber statuses to the 'ODB Data for GPRS services'
Source:	⌘	CN4
Work item code:	⌘	ODB enhancements
Date:	⌘	5th January 2001
Category:	⌘	**B**
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.

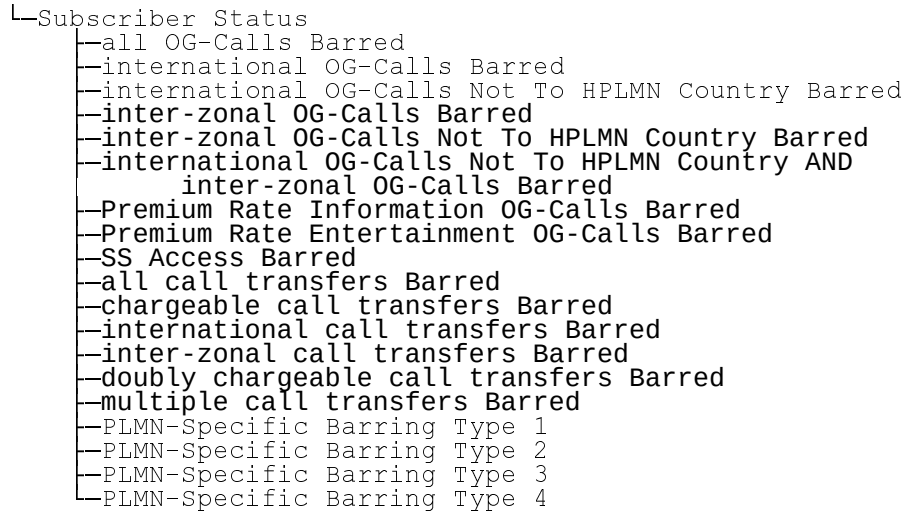
Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	According to the WID of ODB for Packet Oriented Services, this CR expands to apply the ODB feature to the Packet Oriented Services.
Summary of change:	⌘	This CR introduces the new subscriber status for ODB in the GPRS services. In addition, wrong references are corrected.
Consequences if not approved:	⌘	The ODB for Packet Oriented Services cannot be standardised as the Release 4 feature.

Clauses affected:	⌘	4.5.4
Other specs Affected:	⌘	☐ Other core specifications ⌘ 29.002, 23.008, 23.015 ☐ 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:

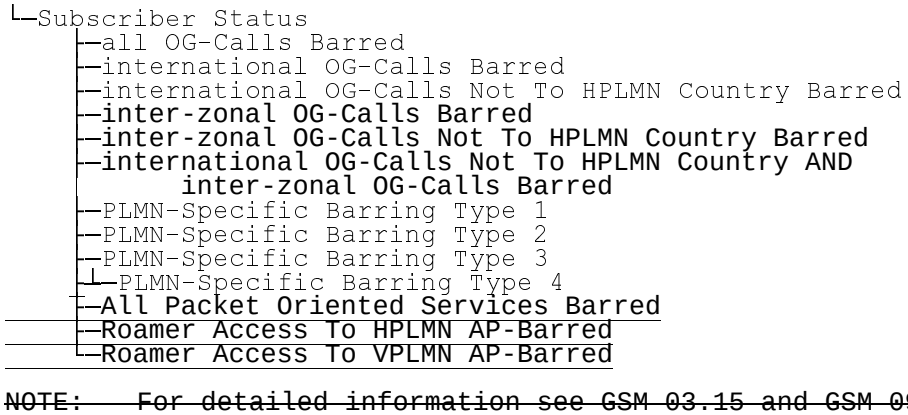
1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") 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.



NOTE: For detailed information see 3G TS 23.015 and 3G TS 29.002.

~~NOTE: For detailed information see GSM 03.15 and GSM 09.02.~~

Figure 8: ODB Data for non-GPRS services



~~NOTE: For detailed information see GSM 03.15 and GSM 09.02.~~

NOTE: For detailed information see 3G TS 23.015 and 3G TS 29.002.

Figure 9: ODB Data for GPRS services

3GPP TSG-CN4 Ad hoc Meeting ***Tdoc N4-010276***
Madrid, Spain, 13th – 15th February 2001

CR-Form-v3

CHANGE REQUEST

⌘ **29.002** **CR** **215** ⌘ rev **2** ⌘ Current version: **4.2.1** ⌘

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

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

Title:	⌘	Add parameters to ISD and SRI for GPRS to handle ODB for PS
Source:	⌘	CN4
Work item code:	⌘	ODB enhancements
Date:	⌘	1st February 2001
Category:	⌘	**B**
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:	⌘	According to the WID of ODB for Packet Oriented Services, this CR expands to apply the ODB feature to the Packet Oriented Services.
Summary of change:	⌘	This CR consists of the following Changes. 1. ODB general data will have barring information applied for packet oriented services in order to be carried to SGSN by the ISD request message. 2. Parameter value 'call barred' will be able to set in the SRI for GPRS response message in case that specified IMSI is barred packet services by ODB. (This enhancement requires upgrading the AC version.)
Consequences if not approved:	⌘	The ODB for Packet Oriented Services cannot be standardised as the Release 4 feature.

Clauses affected:	⌘	5.1.2, 13.1.3, 17.1.6, 17.2.2.36, 17.3.2.33, 17.6.1, 17.7.1, 17.7.7		
Other specs Affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.015, 23.008, 23.016
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.

Table 5.1/1: Priorities of Application Contexts for HLR as Responder

	Responder = HLR	**Initiating Entity**
Priority high		
	Mobility Management	
	networkLocUp (updateLocation), (restoreData/v2), (sendParameters/v1)	VLR
	gprsLocationUpdate (updateGPRSLocation/v3),	SGSN
	infoRetrieval (sendAuthenticationInfo/v2/v3), (sendParameters/v1)	VLR/SGSN
	istAlerting (istAlert/v3) (purgeMS/v2/v3)	MSC msPurging VLR
	msPurging (purgeMS/v3)	SGSN
	Short Message Service	
	shortMsgGateway (sendRoutingInfoforSM), (reportSM-DeliveryStatus)	GMSC
	mwdMngt (readyForSM/v2/v3), (noteSubscriberPresent/v1)	VLR/SGSN
	Mobile Terminating Traffic	
	locInfoRetrieval (sendRoutingInfo)	GMSC
	anyTimeEnquiry (anyTimeInterrogation)	gsmSCF
	reporting (statusReport)	VLR
	Location Services	
	locationSvcGateway (sendRoutingInfoforLCS/v3)	GMLC
	Subscriber Controlled Inputs (Supplementary Services)	
	networkFunctionalSs (registerSS), (eraseSS), (activateSS), (deactivateSS), (interrogateSS), (registerPassword), (processUnstructuredSS-Data/v1), (beginSubscriberActivity/v1)	VLR
	callCompletion (registerCCEntry), (eraseCCEntry)	VLR
	networkUnstructuredSs (processUnstructuredSS-Request/v2)	VLR
	imsiRetrieval (sendIMSI/v2)	VLR
	gprsLocationInfoRetrieval (sendRoutingInfoForGprs/v3/v4)	GGSN/SGSN
	failureReport (failureReport/v3)	GGSN/SGSN
	authenticationFailureReport (authenticationFailureReport/v3)	VLR/SGSN
Priority low		

NOTE: The application context name is the last component but one of the object identifier.
Operation names are given in brackets for information with "/vn" appended to vn only operations.

Next Change

13.1 MAP_SEND_ROUTING_INFO_FOR_GPRS service

13.1.1 Definition

This service is used by the GGSN to request GPRS routing information from the HLR.

13.1.2 Service primitives

Table 13.1/1: MAP_SEND_ROUTING_INFO_FOR_GPRS

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)	M(=)	M(=)
IMSI	M	M(=)		
GGSN address	C	C(=)	C	C(=)
GGSN number	M	M(=)		
SGSN address			C	C(=)
Mobile Not Reachable Reason			C	C(=)
User error			C	C(=)
Provider error				O

13.1.3 Parameter definition and use

Invoke Id

See definition in subclause 7.6.1.

IMSI

See definition in subclause 7.6.2.

GGSN address

This parameter shall be present if the protocol-converting GSN is used between the GGSN and the HLR.

GGSN number

See definition in subclause 7.6.2.

SGSN address

This parameter shall be present if the outcome of the Send Routing Info For GPRS request to the GPRS application process in the HLR is positive.

Mobile Not Reachable Reason

This parameter shall be present if the outcome of the Send Routing Info For GPRS request to the GPRS application process in the HLR is positive and the MNRG flag in the HLR is set. See definition in subclause 7.6.3.51.

User error

This parameter is sent by the responder when an error is detected and if present, takes one of the following values:

- Absent Subscriber;
- System Failure;

- Data Missing;
- Unexpected Data Value;
- Unknown Subscriber.

The diagnostic in the Unknown Subscriber may indicate “Imsi Unknown” or “Gprs Subscription Unknown”.

- Call Barred;

This error will indicate that the received PDP PDUs in the GGSN shall be barred for this MS due to Operator Determined Barring. (The CallBarringCause must be the operatorBarring.)

Provider error

These are defined in subclause 7.6.1.

Next Change

17.1.6 Application Contexts

The following informative table lists the latest versions of the Application Contexts used in this specification, with the operations used by them and, where applicable, whether or not the operation description is exactly the same as for previous versions. Information in 17.6 & 17.7 relates only to the ACs in this table.

AC Name	AC Version	Operations Used	Comments
locationCancellationContext	v3	cancelLocation	
equipmentMngtContext	v2	checkIMEI	
imsiRetrievalContext	v2	sendIMSI	
infoRetrievalContext	v3	sendAuthenticationInfo	
interVlrInfoRetrievalContext	v3	sendIdentification	
handoverControlContext	v3	prepareHandover forwardAccessSignalling sendEndSignal processAccessSignalling prepareSubsequentHandover	the syntax of this operation has been extended in comparison with release 98 version
mwdMngtContext	v3	readyForSM	
msPurgingContext	v3	purgeMS	
shortMsgAlertContext	v2	alertServiceCentre	
resetContext	v2	reset	
networkUnstructuredSsContext	v2	processUnstructuredSS-Request unstructuredSS-Request unstructuredSS-Notify	
tracingContext	v3	activateTraceMode deactivateTraceMode	
networkFunctionalSsContext	v2	registerSS eraseSS activateSS deactivateSS registerPassword interrogateSS getPassword	
shortMsgMO-RelayContext	v3	mo-forwardSM	
shortMsgMT-RelayContext	v3	mt-forwardSM	
shortMsgGatewayContext	v3	sendRoutingInfoForSM reportSM-DeliveryStatus InformServiceCentre	the syntax of this operation has been extended in comparison with release 96 version

AC Name	AC Version	Operations Used	Comments
networkLocUpContext	v3	updateLocation forwardCheckSs-Indication restoreData insertSubscriberData activateTraceMode	the syntax is the same in v1 & v2
gprsLocationUpdateContext	v3	updateGprsLocation insertSubscriberData activateTraceMode	
subscriberDataMngtContext	v3	insertSubscriberData deleteSubscriberData	
roamingNumberEnquiryContext	v3	provideRoamingNumber	
locationInfoRetrievalContext	v3	sendRoutingInfo	
gprsNotifyContext	v3	noteMsPresentForGprs	
gprsLocationInfoRetrievalContext	~~v3~~v4	sendRoutingInfoForGprs	
failureReportContext	v3	failureReport	
callControlTransferContext	v4	resumeCallHandling	
subscriberInfoEnquiryContext	v3	provideSubscriberInfo	
anyTimeEnquiryContext	v3	anyTimeInterrogation	
anyTimeInfoHandlingContext	v3	anyTimeSubscriptionInterrogation anyTimeModification	
ss-InvocationNotificationContext	v3	ss-InvocationNotification	
sIWFSAllocationContext	v3	provideSIWFSNumber sIWFSSignallingModify	
groupCallControlContext	v3	prepareGroupCall processGroupCallSignalling forwardGroupCallSignalling sendGroupCallEndSignal	
reportingContext	v3	setReportingState statusReport remoteUserFree	
callCompletionContext	v3	registerCC-Entry eraseCC-Entry	
istAlertingContext	v3	istAlert	
ImmediateTerminationContext	v3	istCommand	
locationSvcEnquiryContext	v3	provideSubscriberLocation subscriberLocationReport	
locationSvcGatewayContext	v3	sendRoutingInfoForLCS	
mm-EventReportingContext	v3	noteMM-Event	
subscriberDataModificationNotificationContext	v3	noteSubscriberDataModified	
authenticationFailureReportContext	v3	authenticationFailureReport	
secureTransportHandlingContext	v3	secureTransportClass1 secureTransportClass2 secureTransportClass3 secureTransportClass4	

Next Change

17.2.2.36 Gprs Interrogation

This operation package includes the operations required for interrogation procedures between HLR and GGSN.

```
GprsInterrogationPackage-v4 ::= OPERATION-PACKAGE
     -- Supplier is HLR if Consumer is GGSN
     CONSUMER INVOKES {
          sendRoutingInfoForGprs}
```

The v3-equivalent package is defined as follows.

```
GprsInterrogationPackage-v3 ::= OPERATION-PACKAGE
     -- Supplier is HLR if Consumer is GGSN
     CONSUMER INVOKES {
          sendRoutingInfoForGprs}
```

~~This package is v3 only.~~

Next Change

17.3.2.33 Gprs Location Information Retreival

This application context is used between HLR and GGSN when retrieving gprs location information.

```
gprsLocationInfoRetrievalContext-v43 APPLICATION-CONTEXT
     -- Responder is HLR if Initiator is GGSN
     INITIATOR CONSUMER OF {
          GprsInterrogationPackage-v43}
::= {map-ac gprsLocationInfoRetrieval(33) version43(43)}
```

The following application-context-name is assigned to the v3-equivalent application-context:

```
{map-ac gprsLocationInfoRetrieval(33) version3(3)}
```

~~This application context is v3 only.~~

Next Change

-- gprs location information retrieval operations

```
SendRoutingInfoForGprs ::= OPERATION                                    --Timer m
     ARGUMENT
          sendRoutingInfoForGprsArg       SendRoutingInfoForGprsArg
     RESULT
          sendRoutingInfoForGprsRes       SendRoutingInfoForGprsRes
     ERRORS {
          AbsentSubscriber,
          SystemFailure,
          DataMissing,
          UnexpectedDataValue,
          UnknownSubscriber,
          CallBarred}
```

Next Change

```
ODB-GeneralData ::= BIT STRING {
     allOG-CallsBarred  (0),
     internationalOGCallsBarred  (1),
     internationalOGCallsNotToHPLMN-CountryBarred  (2),
     interzonalOGCallsBarred (6),
     interzonalOGCallsNotToHPLMN-CountryBarred (7),
     interzonalOGCallsAndInternationalOGCallsNotToHPLMN-CountryBarred (8),
     premiumRateInformationOGCallsBarred  (3),
     premiumRateEntertainementOGCallsBarred  (4),
     ss-AccessBarred  (5),
     allECT-Barred (9),
     chargeableECT-Barred (10),
     internationalECT-Barred (11),
     interzonalECT-Barred (12),
     doublyChargeableECT-Barred (13),
     multipleECT-Barred (14),
     AllPacketOrientedServicesBarred (15),
     RoamerAccessToHPLMN-AP-Barred  (16),
     RoamerAccessToVPLMN-AP-Barred  (17)} (SIZE (15..32))
     -- exception handling: reception of unknown bit assignments in the
     -- ODB-GeneralData type shall be treated like unsupported ODB-GeneralData
```

Next Change

```
CallBarredParam ::= CHOICE {
     callBarringCause                    CallBarringCause,
     -- call BarringCause must not be used in version 3 and higher
     extensibleCallBarredParam           ExtensibleCallBarredParam
     -- extensibleCallBarredParam must not be used in version <3
     }
```

```
CallBarringCause ::= ENUMERATED {
     barringServiceActive  (0),
     operatorBarring  (1)}
```

```
ExtensibleCallBarredParam ::= SEQUENCE {
     callBarringCause                    CallBarringCause                  OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ... ,
     unauthorisedMessageOriginator       [1] NULL                          OPTIONAL }
```