ETSI TS 123 081 V5.0.0 (2002-06)

Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Line Identification supplementary services; Stage 2 (3GPP TS 23.081 version 5.0.0 Release 5)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

Reference
RTS/TSGN-0423081v500

Keywords
GSM, UMTS

ETSI

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Foreword

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Contents

Foreword

This Technical Specification has been produced by the 3GPP.

This TS defines the stage 2 of the line identification supplementary services for the 3GPP system.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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0 Scope

The present document gives the stage 2 description of the call identification supplementary services.

The group line identification supplementary services are divided into the following four supplementary services:

- Calling line identification presentation CLIP (clause 1);

- Calling line identification restriction CLIR (clause 2);

- Connected line identification presentation COLP (clause 3);

- Connected line identification restriction COLR (clause 4).

0.1 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 21.905: "3G Vocabulary".

[2] 3GPP TS 23.011: "Technical Realization of Supplementary Services - General Aspects.

[3] 3GPP TS 23.018 : "Basic Call Handling; Technical realization".

0.2 Definitions and abbreviations

0.2.1 Definitions

0.2.1.1 Definition of line identity

The line identity is made up of the following information units:

- The subscriber's international ISDN/MSISDN number;

- Optionally subaddress information.

For mobile originated calls, the ISDN/MSISDN shall always be provided within the network. The subaddress shall only be included if it is provided by the user (or user equipment).

The calling line identity is the line identity of the calling party. The connected line identity is the line identity of the connected party.

The additional calling line identity provides additional line information for the purpose of the calling line identification presentation service (CLIP). The additional connected line identity provides additional line information for the purpose of the connected line identification presentation service (COLP).

For mobile originating calls the user (or user equipment) has no possibility to provide an additional line identity. For mobile terminating calls the user (or user equipment) has no possibility to provide an additional connected line identity.

0.2.1.2 Definition of presentation and screening indicators

In addition to, or instead of, the line identity or additional line identity, the network may send a presentation indicator (PI) together with a Cause of no CLI (CoNC) and/or a screening indicator (SI) to the MS as follows:

- Presentation Indicator:

    a) Presentation allowed;

    b) Presentation restricted;

    c) Number not available.

- If the Presentation Indicator indicates "presentation restricted" the Cause of no CLI may give a diagnostic:

    a) Unavailable;

    b) Rejected by user;

    c) Interaction with other services;

    d) Coin line/ Pay phone.

- Screening indicator:

    a) User provided, verified and passed;

    b) User provided, not screened;

    c) network provided.

The screening indicator applies to the ISDN/MSISDN or the number given as additional line identity respectively.

0.2.2 Abbreviations

Abbreviations used in the present document are listed in 3G TR 21.905.

1 Calling line identification presentation (CLIP)

1.1 Handling of calling line identification presentation

1.1.1 Interrogation

Status check

The mobile subscriber can request the status of the supplementary service and be informed if the service is provided to him/her. This procedure is illustrated in figure 1.1.
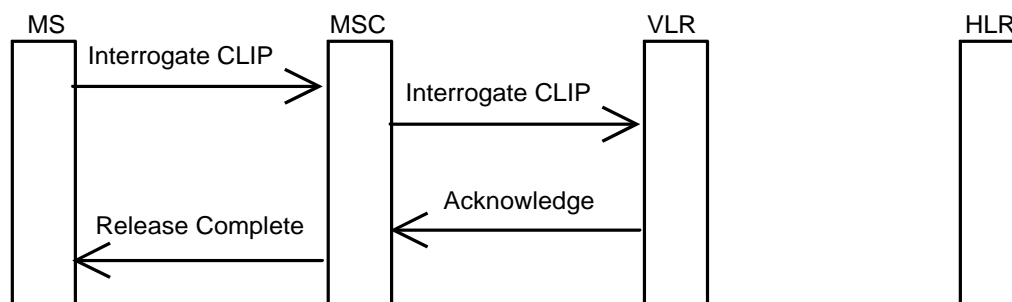
Figure 1.1: Interrogation of calling line identification presentation

1.2 Functions and information flows

The following Mobile Additional Functions have been identified for the PLMN:

MAF001

Determination of the calling line identification presentation subscription

The ability of a PLMN component to determine whether the supplementary service is provisioned for the mobile subscriber. See figure 1.2.

Location: VLR.

MAF002

Determination of the calling party number for offering to the called party

The ability of a PLMN component to determine and to forward the calling line identity and related indications to the called party. See figure 1.3.

Location: destination MSC.

The information flow is shown in figure 1.9.

Process CLIP_MAF001   381_12(1)

Figure 1.2

idle

initiate
handling
of CLIP

CLIP
provisioned — yes

no

set provision
indication =
not provisioned

set provision
indication =
provisioned

called
subscriber
in HPLMN
country — no

yes

override
category — no

yes

set override
category = yes

set override
category = no

continue
call
handling

idle

CLIP: Calling Line Identification Presentation.

**Figure 1.2: MAF001 Determination of calling line identification presentation subscription
(VLR)**

Process CLIP_MAF002   381_13(1)

Figure 1.3

Idle

initiate
handling
of CLIP

CLIP
provisioned — no

yes

CLI
available — no

yes

CLI
received from
VLR — no

yes

Use CLI
received
from VLR

use CLI
received from
signaling

PI = presentation restricted?

Yes

no

Cause of
no CLI

additional
CLI
available
No

yes

override
category — yes

no

PI = presentation
restricted by
network?

additional
CLI
available — no

Yes

yes

override
category

CLI
in case of
override category — CLI

No

additional
CLI

set PI =
presentation
restricted

pass
additional
CLI

pass CLI

Set PI =
number not
available

pass CLI

pass
additional
CLI

set PI =
number not
available

continue
call
handling

idle

CLIP: Calling Line Identification Presentation.
CLI: Calling Line Identity.
PI: Presentation Indicator.

**Figure 1.3: MAF002 Determination of the information for offering to the called party
(destination MSC)**

Procedure Cause_of_no_CLI 1(1)

CoNC : Cause of no CLI

Cause of no CLI supported?

Yes

No

CoNC = reject by user?

No

Yes

CoNC = interworking with other services?

Yes

CoNC = Coin line/ payphone?

Yes

CoNC = Unavailable?

Yes

No

Set CoNC = Unavailable

Set CoNC = Coin line/ payphone

Set CoNC = Interworking with other services

Set CoNC = Reject by user
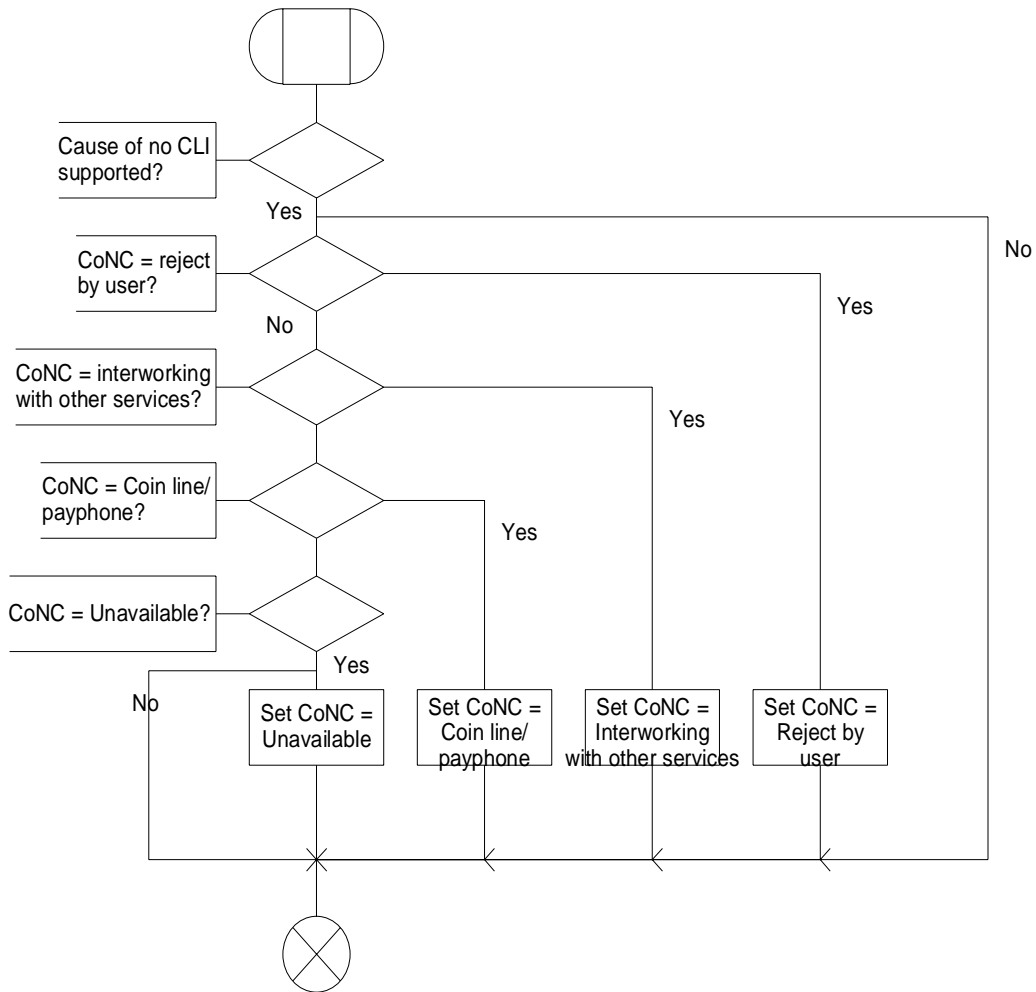
Figure 1.4: Procedure Cause_of_no_CLI

Procedure CLI_MT_GMSC   1(1)

Add Calling Party
Number and Generic
Number to the SRI
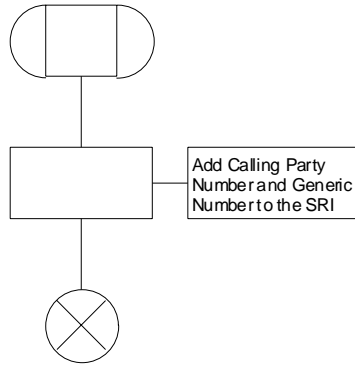
Figure 1.5: Addition of line identification information to Send Routeing Info message.

Procedure CLI_HLR_Set_CLI 1(1)

```
                                No          Subscriber roaming
                             ◇──────────     outside home
                                             country

                                  │ Yes

                                No          Sending of CLI
                             ◇──────────     information allowed
                                             to destination NW

                                  │ Yes

                                No          CLI information
                             ◇──────────     received from GMSC

                                  │ Yes

                             ┌─────────┐    Add Calling Party
                             │         │    Number and Generic
                             └─────────┘    Number to the PRN

                                  ⊗
```
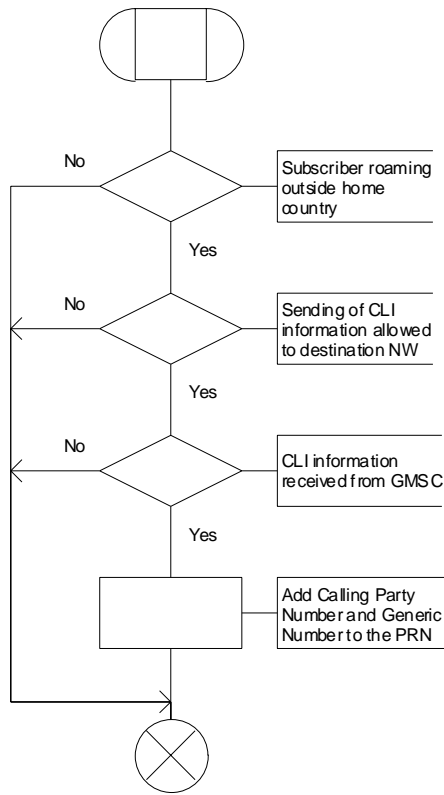
Figure 1.6: Addition of line identification information to Provide Roaming Number message.

Procedure CLI_PRN_VLR   1(1)

CLI Information received from HLR

No

Yes

Subscriber roaming outside home country

No

Yes

Store CLI information
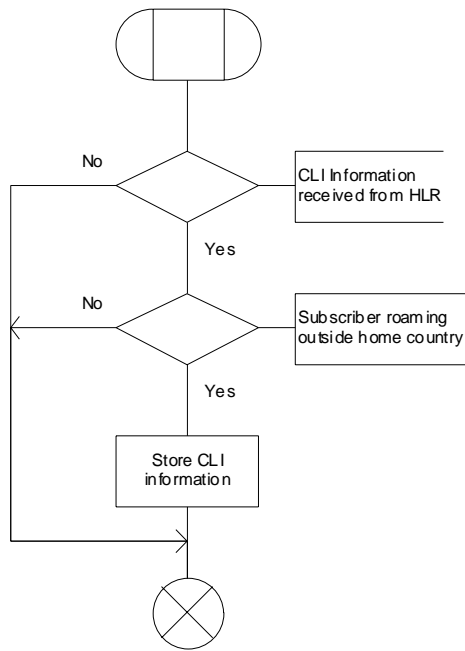
Figure 1.7: Storing of Line Identification in destination VLR

Procedure CLI_ICH_VLR_Add_CLI 1(1)

CLI information stored in VLR

No / Yes

Add Calling Party Number and Generic Number to message to MSC
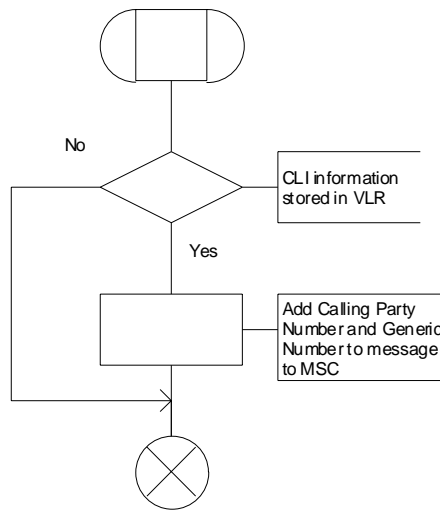
Figure 1.8: Addition of line identification information to Complete Call/Process Call Waiting message.

S/TE   MSCa/LE   VLRb   MSCb   MSb

set-up

set-up
(SI+PI+CoNC+LI+aSI+aPI+aLI)

MAF
001
                              info req

                              info ack
                                            MAF002

                                                      set-up
                                                      (SI+PI+CoNC+LI)

S/TE   MSCa/LE   GMSC   HLRb   VLRb   MSCb   MSba

set-up

set-up

(SI+PI+CoNC+LI+aSI+aPI+aLI)

SRI

(SI+PI+LI+aSI+aPI+aLI)

PRN

(SI+PI+LI+aSI+aPI+aLI)

PRN ack

SRI ack

set-up
(SI+PI+CoNC+LI+aSI+aPI+aLI)

info req

MAF
001
info ack

MAF
002
                                                                    set-up

                                                                    (SI+PI+CoNC+LI)

Figure 1.9: Information flow for calling line identification presentation:
mobile station or fixed terminal to mobile station

NOTE:

    **: A subaddress may be received from the originating MS or the TE
    info: information   SI: screening indicator   aSI: additional screening indicator
    req: request   PI: presentation indicator   CoNC: cause of no CLI
    aPI: additional presentation indicator
    ack: acknowledge LI: line identity   aLI: additional line identity

NOTE: For mapping rules of CLI parameters refer to Annex A.

1.2.1 Optional capability to carry calling line identification

When GMSC is performing Send Routing Info query it may pass calling line identification to the HLRb. The calling line identification shall be in international format. If the HLRb receives calling line identification within Send Routing Info it may pass unmodified calling line identification within Provide Roaming Number to the VLRb. HLR shall not pass cal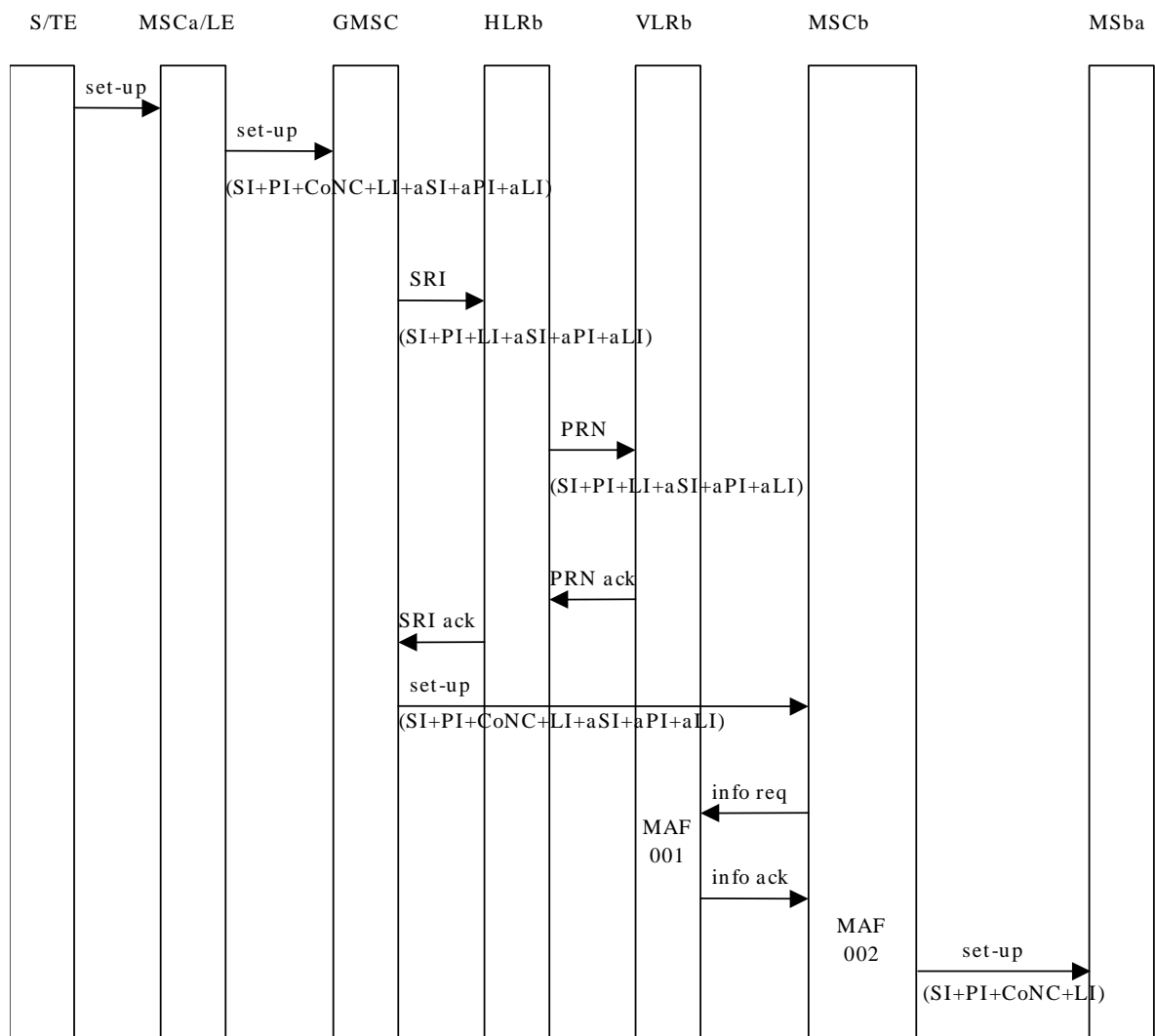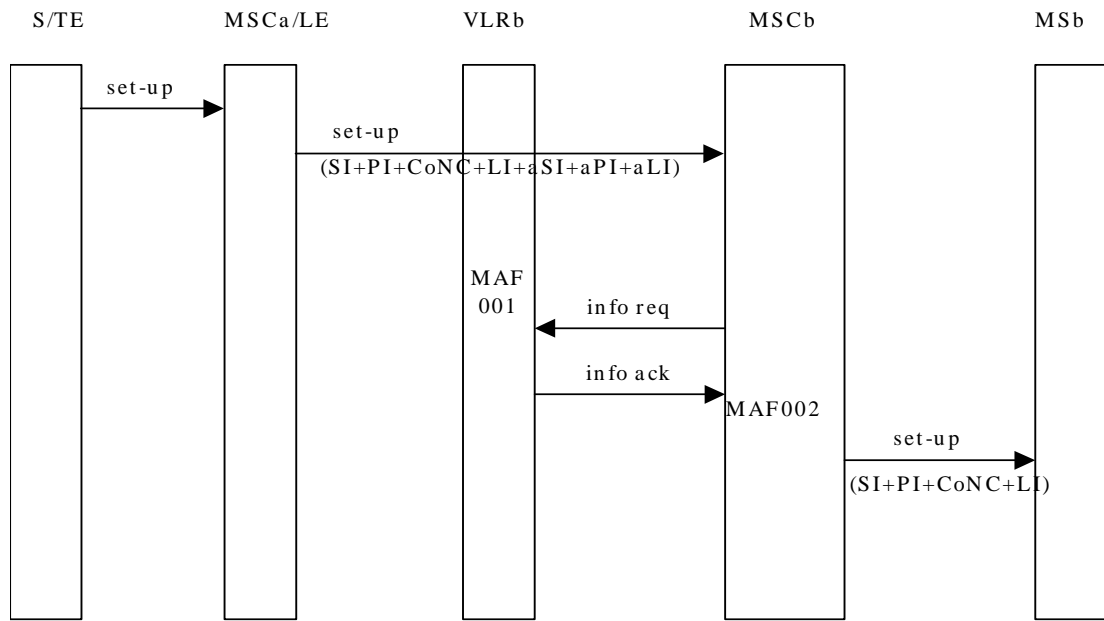ling line identification in the HPLMN nor in the case where sending of the CLI information is explicitly denied to the destination network..

If MSCb receives calling line identification only from signalling it shall use that parameter for presentation purposes i.e. normal handling as described in the previous subclause applies.

If MSCb receives Cause of no CLI from signalling it shall be sent to the VLRb by Send Info for Incoming Call query.

If MSCb receives calling line identification and/or Cause of no CLI from VLRb and it supports the feature it shall use that parameter for presentation purposes. In this case calling line identification is stored in the VLRb and when the set-up message is processed the handling described in the previous subclause is done using the stored calling line identification.

1.2.2 Information elements used in the messages

Table 1.2.2.1: Information elements used in messages

Information Element	Logical Information element name	Information element Required	Information element description
Calling Party Number	SI PI LI	M M M	Calling Party Number contains screening indicator (SI), presentation indicator (PI) and line identity (LI) as mandatory information.
Generic Number	aSI aPI aLI	M M M	Generic Number contains additional screening indicator (aSI), additional presentation indicator (aPI) and additional line identity (aLI) as mandatory information.
Cause of no CLI	unavailable reject by user interaction with other service coin line/payphone	M M M M	Cause of no CLI contains detailed Cause of no CLI (unavailable, reject by user, interaction with other service, coin line/payphone) as mandatory information.

1.2.3 Parameters in Send Routeing Info and Provide Roaming Number for CLI

Table 1.2.3.1: Messages between GMSC and HLR

Message	Message sender	Information element name	Information element Required	Information element description
Send Routeing Info	GMSC	-	-	Refer to 3G TS 23.018.
		Calling Party Number	C	In addition: The information element is present if GMSC received calling party number from originating network; otherwise it shall be absent.
		Generic Number	C	The information element is present if GMSC received calling party number from originating network; otherwise it shall be absent.

Table 1.2.3.2: Messages between HLR and VLR

Message	Message sender	Information element name	Information element Required	Information element description
Provide Roaming Number	HLR	-	-	Refer to 3G TS 23.018.
		Calling Party Number	C	In addition: The information element is present if HLR received calling party number from GMSC and MS B is outside of home country; otherwise it shall be absent.
		Generic Number	C	The information element is present if HLR received calling party number from GMSC and MS B is outside of home country; otherwise it shall be absent.

1.2.4 Messages between MSC and VLR in destination network

Table 1.2.4.1: Messages between MSC and VLR

Message	Message sender	Information element name	Information element Required	Information element description
Complete Call	VLR	-	-	Refer to 3G TS 23.018. In addition: The information element is present if it is stored in VLR; otherwise it shall be absent.
		Calling Party Number	C	
		Generic Number	C	The information element is present if it is stored in VLR; otherwise it shall be absent.
			C	The information element is present if it is stored in VLR; otherwise it shall be absent.
Process Call Waiting	VLR	-	-	Refer to 3G TS 23.018. In addition: The information element is present if it is stored in VLR; otherwise it shall be absent.
		Calling Party Number	C	
		Generic Number	C	The information element is present if it is stored in VLR; otherwise it shall be absent.
		Cause of no CLI	C	The information element is present if it is stored in VLR; otherwise it shall be absent.
Send Info for Incoming Call	MSC	-	-	Refer to 3G TS 23.018.
		Cause of no CLI	C	In addition: The information element is present if MSC received Cause of no CLI; otherwise it shall be absent.

1.3 Information stored in the HLR

CLIP may have the following logical states (refer to 3G TS 23.011 for an explanation of the notation):

Provisioning State	Registration State	Activation State	HLR Induction State
(Not Provisioned,	Not Applicable,	Not Active,	Not Induced)
(Provisioned,	Not Applicable,	Active and Operative,	Not Induced)

The HLR shall store the logical state of CLIP (which shall be one of the valid states listed above) on a per subscriber basis.

The HLR shall also store the subscription option "override category" on a per subscriber basis.

This parameter takes one of the following values:

1. yes;

2. no.

1.4 State transition model

The following figure shows the successful cases of transition between the applicable logical states of CLIP. The state changes are caused by actions of the service provider.

Note that error cases are not shown in the diagram as they normally do not cause a state change. Additionally, some successful requests may not cause a state change. Hence they are not shown in the diagram.
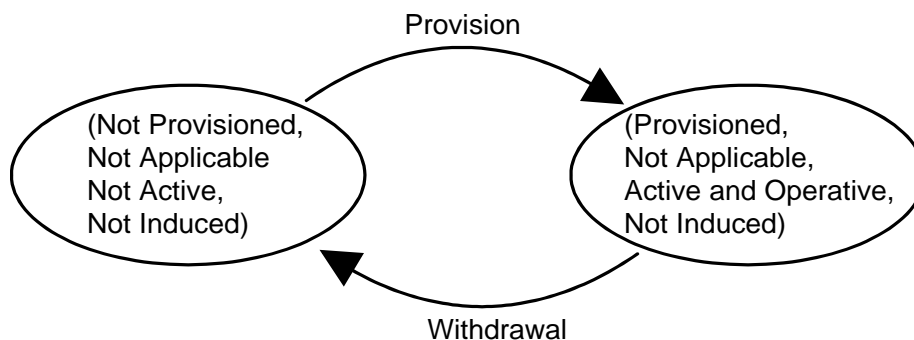

Figure 1.9: State transition model for CLIP

1.5 Transfer of information from HLR to VLR

If the provisioning state for CLIP is "Provisioned" then, when the subscriber registers on a VLR, the HLR shall send that VLR information about the logical state of CLIP. The HLR shall send the override category if the VLR is in the HPLMN country. The HLR may send the override category if the VLR is outside the HPLMN country.

If the logical state of CLIP or the override category is changed while a subscriber is registered on a VLR then the HLR shall inform the VLR of the new logical state of CLIP. If the override category is changed and the provisioning state of CLIP is "Provisioned" then the HLR shall inform the VLR about the new override category when the VLR is in the HPLMN country. The HLR may inform the VLR about the new override category when the VLR is outside the HPLMN country.

1.6 Information stored in the VLR

For CLIP, the VLR shall store the service state information and override category received from the HLR.

If not received from the HLR (case of roaming outside the HPLMN country), the override category shall be set to the default value "no".

1.7 Handover

Handover will have no impact on the control procedures and the operation of the service.

2 Calling line identification restriction (CLIR)

2.1 Handling of calling line identification restriction

2.1.1 General

If the originating party has calling line identification restriction provisioned and it is impossible to indicate to the terminating network (due to interworking) that the number should not be presented to the terminating party, the calling line identity shall not be delivered to the terminating network.

2.1.2 Permanent mode

If the subscriber has calling line identification restriction provisioned in permanent mode, the originating party's CLI shall not be presented to the terminating party (i.e. the terminating MS or TE), unless the terminating party has calling line identification presentation provisioned with the subscription option "override category" set (see clause 1).

2.1.3 Controlling presentation of the CLI when CLIR is provisioned in temporary mode

A subscriber can have calling line identification restriction provisioned in temporary mode with one of two default values: presentation restricted or presentation allowed.

If the default value is set to presentation restricted, the default handling is not to present the originating party's CLI to the terminating party (i.e. the terminating MS or TE).

However, it is possible for the originating subscriber to present his CLI to the terminating party. The originating subscriber must indicate during call set-up that the CLI must be presented to the terminating party. This procedure is illustrated in figure 2.1.
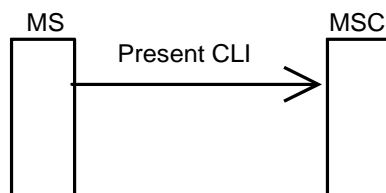
Figure 2.1: MS indicating presentation of CLI when CLIR is provisioned in temporary mode with default value "presentation restricted"

If the default value is set to presentation allowed, the default handling is to present the originating party's CLI to the terminating party (i.e. the terminating MS or TE).

However, it is possible for the originating subscriber to restrict presentation of his CLI to the terminating party. The originating subscriber must indicate during call set-up that CLI presentation must be restricted. This procedure is illustrated in figure 2.2.
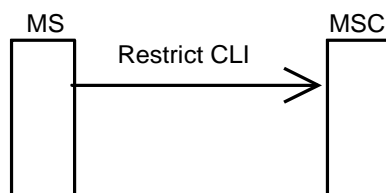
Figure 2.2：MS invoking CLIR, when CLIR is provisioned in temporary mode with default value "presentation allowed"

2.1.4 Interrogation

Data request

The mobile subscriber can request the data of the supplementary service.

In response the following information shall be given:

- whether the service is provided or not;

- if provided which mode is subscribed;

- if subscribed to the temporary mode: which default value.

This procedure is illustrated in figure 2.3.
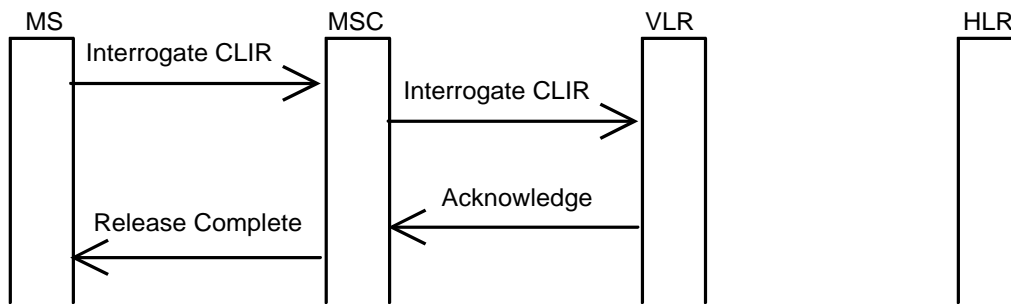
Figure 2.3: Interrogation of calling line identification restriction

2.2 Functions and information flows

The following Mobile Additional Functions have been identified for the PLMN:

MAF003

Determination of the calling line identification restriction subscription

The ability of a PLMN component to determine whether the supplementary service is provisioned for the mobile subscriber. See figure 2.4.

Location: VLR.

MAF004

Determination of the calling party number for offering to the called party

The ability of a PLMN component to determine and to forward the calling line identity and related indications to the called party. See figure 2.5.

Location: originating MSC.

The information flows are shown in figures 2.6 to 2.9.

Process CLIR_MAF003 381_24(1)

Figure 2.4

idle

initiate
handling
of CLIR

CLIR
provisioned

no → set provision
indication =
not provisioned

yes

set provision
indication =
provisioned

subscription
option =
permanent

yes → set mode
indication =
permanent

no

temporary
mode default =
pres. restricted

no → mode indication =
temporary
(pres. allowed)

yes

mode indication =
temporary
(pres. restricted)

continue
call
handling

CLIR: Calling Line Identification Restriction

idle

**Figure 2.4: MAF003 Determination of calling line identification restriction subscription
(VLR)**

Process CLIR_MAF004 381_25(1)

Figure 2.5

idle

initiate handling of CLIR

CLIR provisioned — no / yes

restrict CLI note 2 — yes / no

permanent — no / yes

present CLI note 1 — yes / no

temporary mode default = pres. restricted — no / yes

clear call

error notification

present CLI note 1 — no / yes

restrict CLI note 2 — no / yes

set PI = presentation allowed

set PI = presentation restricted

set PI = presentation allowed

set PI = presentation restricted

continue call handling

note 1: present CLI is input received from the mobile station
note 2: restrict CLI is input received from the mobile station

idle

CLIR: Calling Line Identification Restriction
CLI: Calling Line Identity
PI: Presentation Indicator

**Figure 2.5: MAF004 Determination of the presentation indicator
(originating MSC)**

ETSI

Procedure Cause_of_no_CLI_CLIR 1(1)

Cause of no CLI supported?
No
Yes

rejected by user?
Yes
No

interacted with other services?
Yes
No

coin line/ payphone?
Yes
No

Unavailable?
No
Yes

Set CoNC = coin line/payphone

Set CoNC = unavailable

Set CoNC = interaction with other services

Set CoNC = reject by user

No
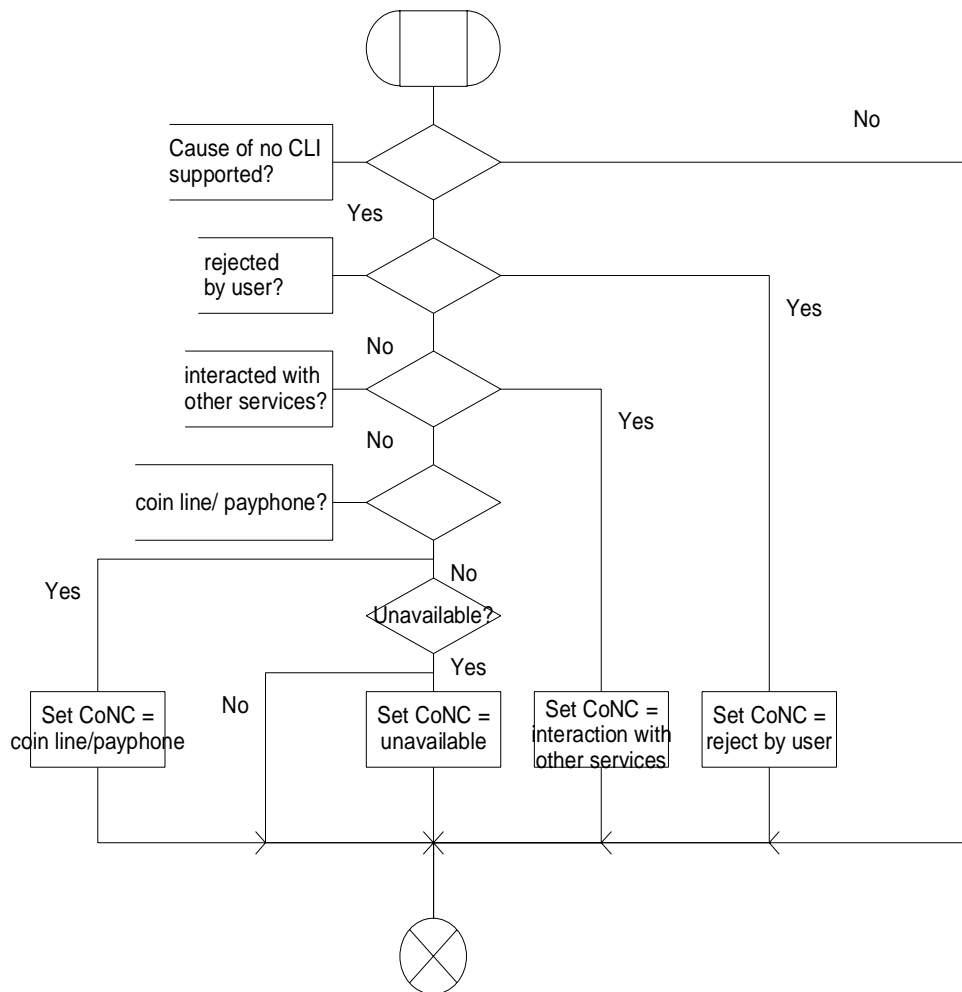
Figure 2.6: Procedure Cause_of_no_CLI_CLIR
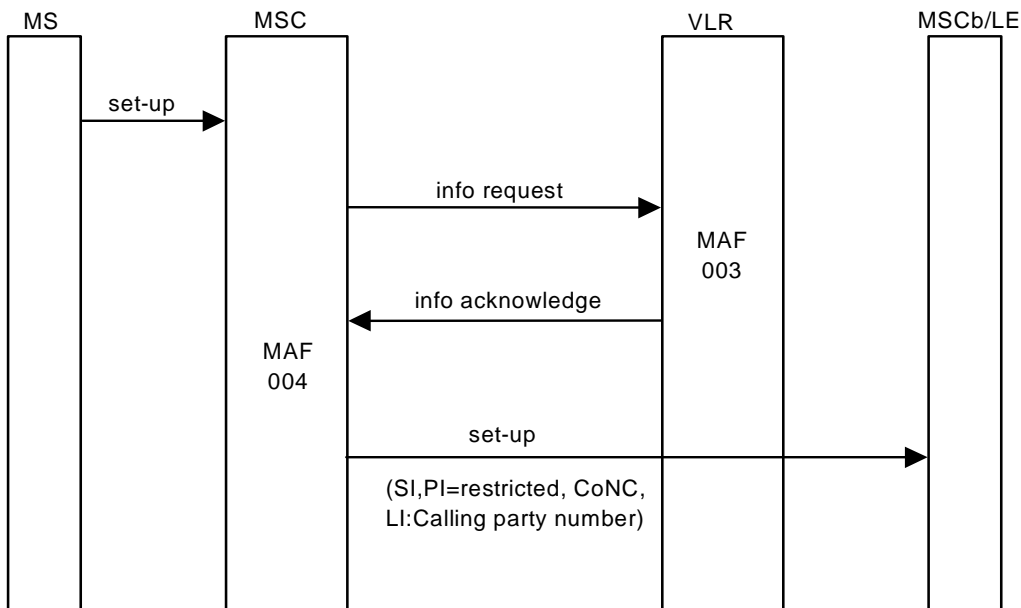
Figure 2.7: Information flow for calling line identification restriction in permanent or temporary mode with the default value "presentation restricted"

NOTE: **: A subaddress may be received from the MS
        SI: screening indicator
        PI: presentation indicator
        LI: line identity
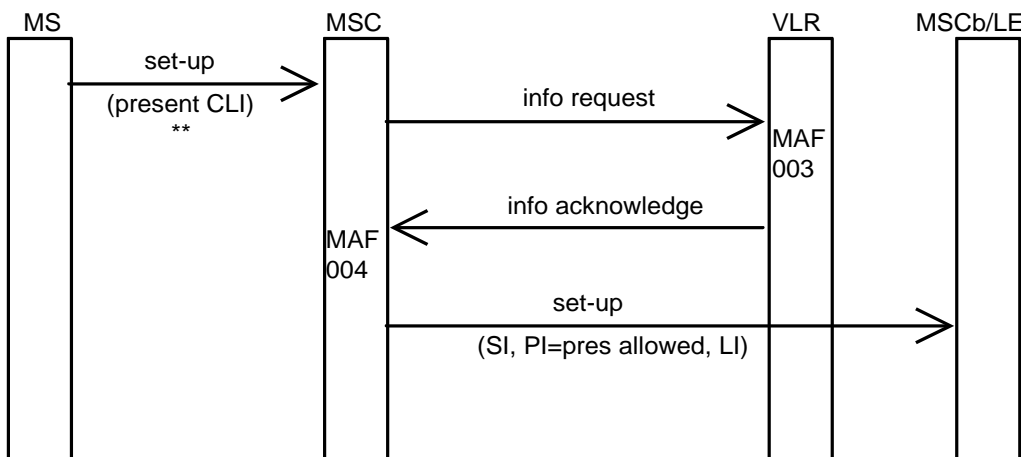
Figure 2.8: Information flow for allowing presentation of the CLI when CLIR is provisioned in temporary mode with default value "presentation restricted"

NOTE: **: A subaddress may be received from the MS
        SI: screening indicator
        PI: presentation indicator
        LI: line identity
        CLI: calling line identity

NOTE: **: A subaddress may be received from the MS
SI: screening indicator
PI: presentation indicator
LI: line identity

Figure 2.9： **Information flow for calling line identification restriction in temporary mode with default value "presentation allowed"**

NOTE: **: A subaddress may be received from the MS
SI: screening indicator
PI: presentation indicator
LI: line identity
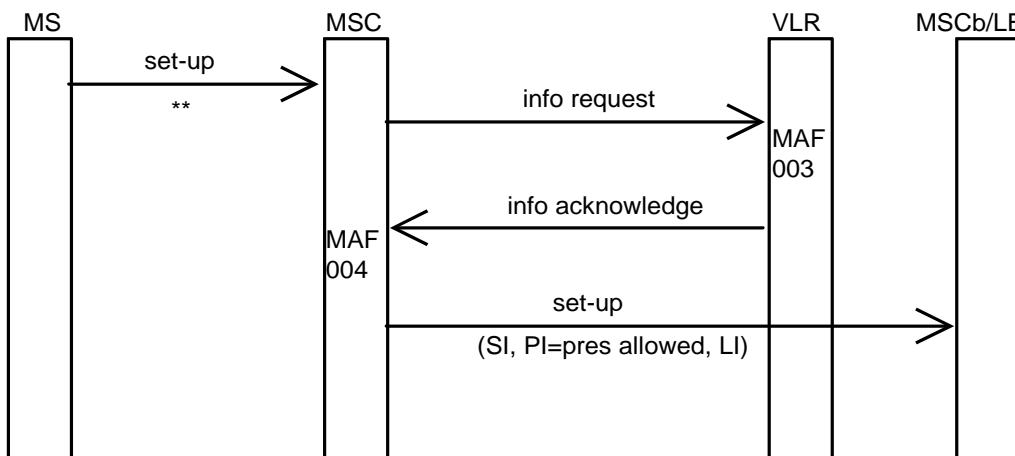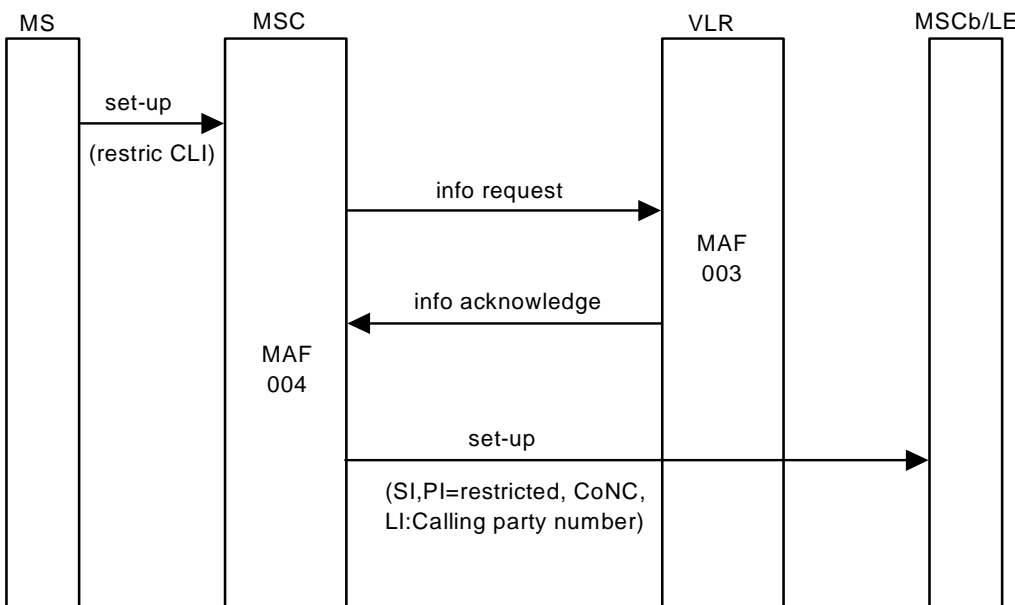CLI: calling line identity

2.3 Information stored in the HLR

CLIR may have the following logical states (refer to 3G TS 23.011 for an explanation of the notation):

Provisioning State	Registration State	Activation State	HLR Induction State
(Not Provisioned,	Not Applicable,	Not Active,	Not Induced)
(Provisioned,	Not Applicable,	Active and Operative,	Not Induced)

The HLR shall store the logical state of CLIR (which shall be one of the valid states listed above) on a per subscriber basis.

The HLR shall also store the subscription option "presentation mode" on a per subscriber basis.

This parameter takes one of the following values:

- permanent;

- temporary (presentation restricted);

- temporary (presentation allowed).

2.4 State transition model

The following figure shows the successful cases of transition between the applicable logical states of CLIR. The state changes are caused by actions of the service provider.

Note that error cases are not shown in the diagram as they normally do not cause a state change. Additionally, some successful requests may not cause a state change. Hence they are not shown in the diagram.
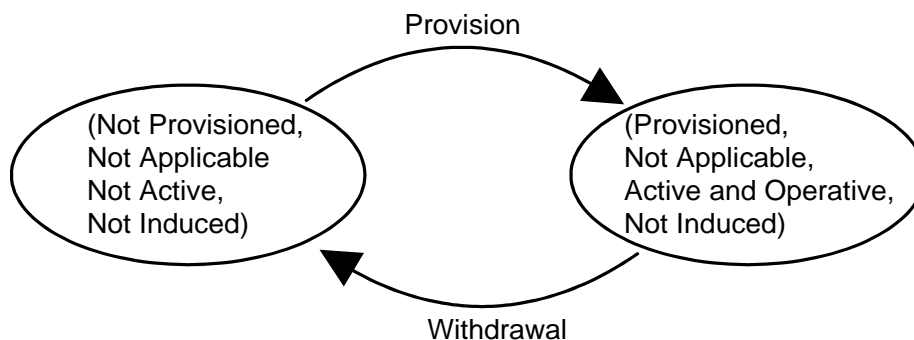
Figure 2.10: State transition model for CLIR

2.5 Transfer of information from HLR to VLR

When the subscriber registers on a VLR, the HLR shall send that VLR information about the logical state of CLIR and the presentation mode.

If the logical state of CLIR or the presentation mode is changed while a subscriber is registered on a VLR then the HLR shall inform the VLR of the new logical state of CLIR and (if the provisioning state is "Provisioned") the new presentation mode.

2.6 Information stored in the VLR

For CLIR, the VLR shall store the service state information and presentation mode received from the HLR.

2.7 Handover

Handover will have no impact on the control procedures and the operation of the service.

2.8 Interworking

The VPLMN needs to distinguish three cases in order to meet data privacy requirements in an environment where support of CLIP and CLIR is optional:

   a) the HPLMN supports CLIR, and CLIR is provisioned for the subscriber;

   b) the HPLMN supports CLIR, but CLIR is not provisioned for the subscriber;

   c) the HPLMN does not support CLIR.

In case a) the VPLMN must apply the CLIR subscription as indicated by the data sent by the HPLMN.

In case b) the VPLMN must not apply CLIR.

In case c) the VPLMN must apply an implicit CLIR subscription.

To allow the VPLMN to make this distinction, the HLR and VLR behave as follows:

   - If the HLR supports CLIR, but CLIR is not provisioned for the subscriber, the HLR shall inform the VLR that CLIR is not provisioned.

   - If the VLR supports CLIR, but the HLR does not support CLIR, the VLR shall behave in the same way as if CLIR (temporary (presentation restricted)) was provisioned for the subscriber, i.e. the calling line identity shall not be displayed to the called subscriber unless the called subscriber has CLIR override capability. When interrogating the service status the subscriber shall be informed that CLIR (temporary (presentation restricted)) is provided to him and is active.

3 Connected line identification presentation (COLP)

3.1 Handling of connected line identification presentation

3.1.1 Interrogation

Status check

The mobile subscriber can request the status of the supplementary service and be informed if the service is provided to him/her. This procedure is illustrated in figure 3.1.
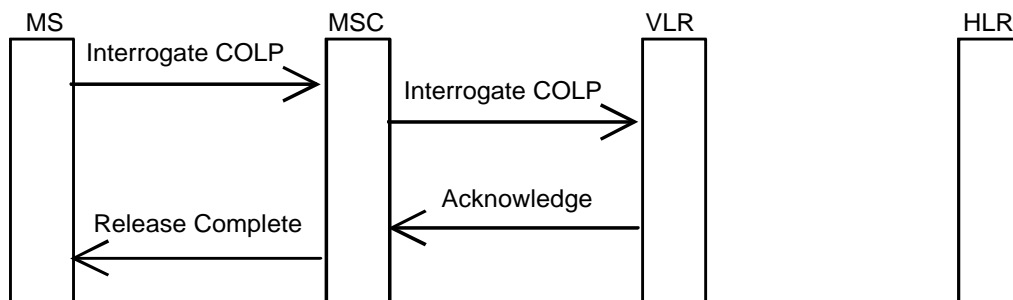
Figure 3.1: Interrogation of connected line identification presentation

3.1.2 Interactions with call forwarding supplementary services

If the forwarding user selects the option that the calling user is not notified of the call forwarding, then the calling user shall receive no forwarding notification, and the calling user shall not receive the connected user's identity when the call is answered, unless the calling user has override capability.

3.2 Functions and information flows

The following Mobile Additional Functions have been identified for the PLMN:

MAF005

Determination of the connected line identification presentation subscription

The ability of a PLMN component to determine whether the supplementary service is provisioned for the mobile subscriber. See figure 3.2.

Location: VLR.

MAF006

Determination of the connected party number for offering to the calling party

The ability of a PLMN component to determine and to forward the connected line identity and related indications to the calling party. See figure 3.3.

Location: originating MSC.

MAF039

Interaction of connected line identification presentation with the call forwarding supplementary services

The ability of a PLMN component to determine the presentation indicator of the connected party number after invocation of a call forwarding service. See figure 3.4.

Location: forwarding MSC.

The information flow is shown in figure 3.5.

Process COLP_MAF005 381_32(1)

Figure 3.2

idle

initiate
handling
of COLP

COLP
provisioned

yes

no

set provision
indication =
not provisioned

set provision
indication =
provisioned

calling
subscriber
in HPLMN
country

no

yes

override
category

no

yes

set override
category = yes

set override
category = no

continue
call
handling

idle

COLP: Connected Line Identification Presentation.

Figure 3.2: MAF005 Determination of connected line identification presentation subscription (VLR)

Process COLP_MAF006 381_33(1)

Figure 3.3

idle

initiate handling of COLP

COLP provisioned — no

yes

COL available — no

yes

presentation restricted — yes

no

override category — yes

no

additional COL available — no

yes

additional COL available — yes

no

COL in case of override category

additional COL

COL

| pass additional COL | pass COL | pass additional COL | set PI = number not available |

continue call handling

COLP: Connected Line Identification Presentation.
COL: Connected Line Identity.
PI: Presentation Indicator.

idle

Figure 3.3: MAF006 Determination of the information for offering to the connected party (originating MSC)

Process COLP_MAF039 381_34(1)

Figure 3.4

```
                              ┌──────────┐
                             (    idle    )
                              └─────┬─────┘
                              ┌─────┴─────┐
                              │ initiate   │
                              │ handling   │
                              │ of COLP    │
                              └─────┬─────┘
                              ╱─────┴─────╲
                             ╱ connected   ╲        no
                             ╲ number      ╱────────────────────────┐
                              ╲ received  ╱                          │
                               ╲────┬────╱                           │
                                  yes                                │
                              ╱─────┴─────╲                          │
                             ╱  notify     ╲      yes                │
                             ╲ calling user╱──────────────────────► │
                              ╲ of         ╱                         │
                               ╲forwarding╱                          │
                                ╲───┬────╱                           │
                                  no                                 │
                              ┌─────┴─────┐                          │
                              │ set PI =   │                          │
                              │ presentation│                         │
                              │ restricted │                          │
                              └─────┬─────┘                          │
                                    │◄────────────────────────────────┘
                              ┌─────┴─────┐
                              │ continue   │
                              │ call       │
                              │ handling   │
                              └─────┬─────┘
                              ┌─────┴─────┐
                             (    idle    )
                              └───────────┘
```

COLP: Connected Line Identification Presentation.
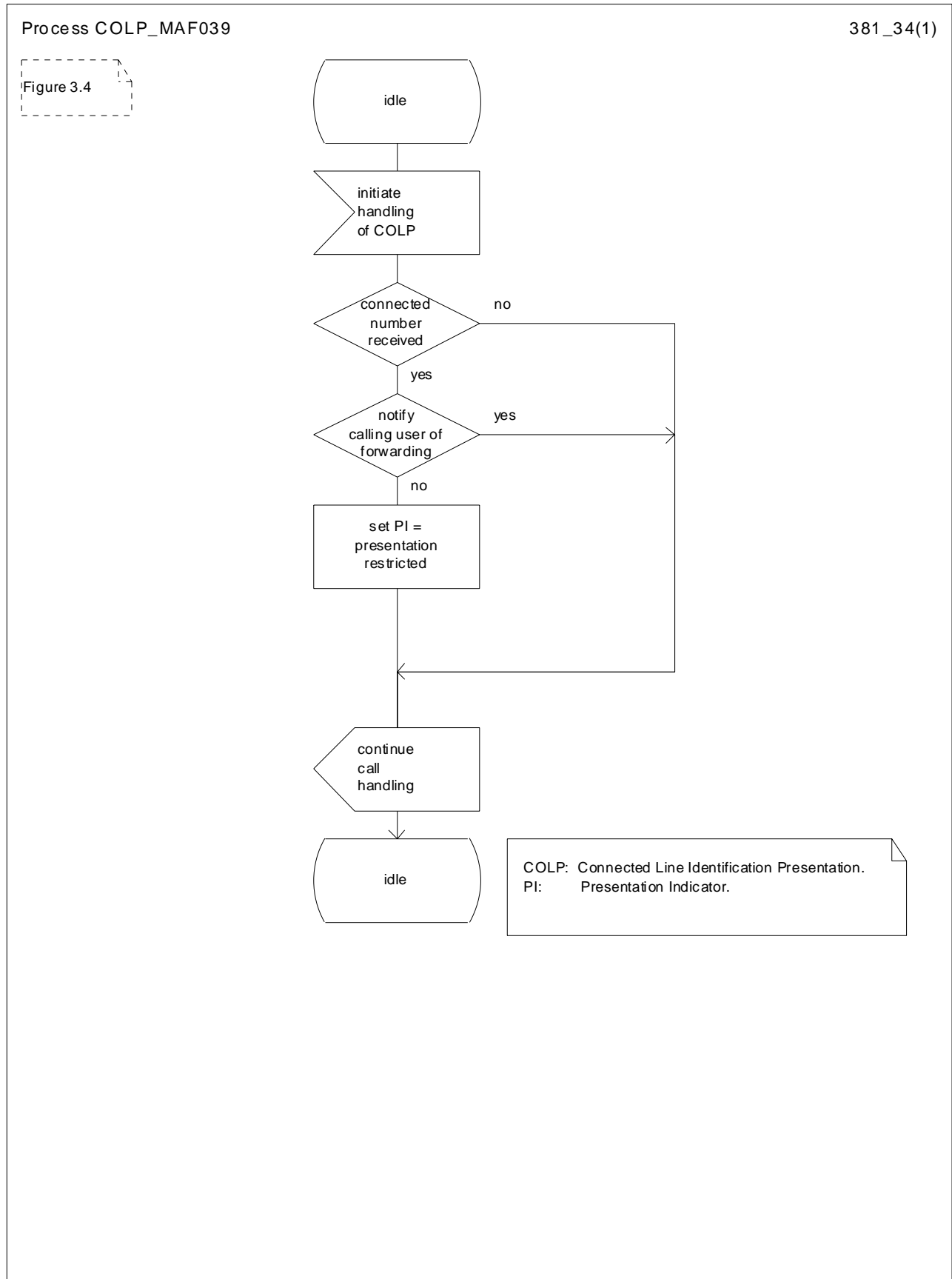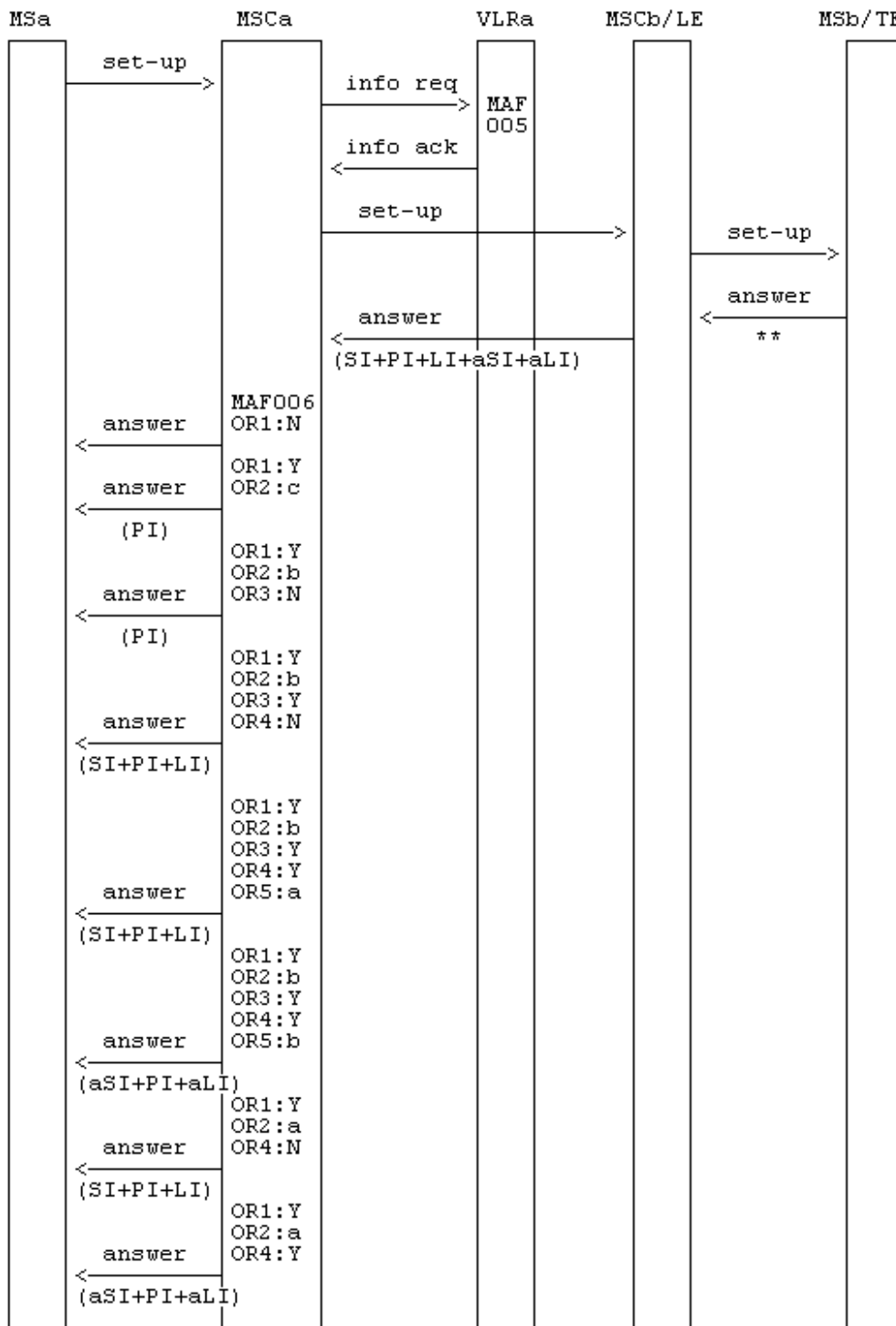PI: Presentation Indicator.

Figure 3.4: MAF039 Interaction between COLP and call forwarding services (forwarding MSC)

**Figure 3.5: Information flow for connected line identification presentation:
mobile station to mobile station or fixed terminal**

NOTE: OR1: COLP provisioned   Y: yes   N: no
       OR2: Presentation Indicator Value   a: allowed b: restricted c: not available
       OR3: Override category
       OR4: additional line identity available   Y: yes   N: no
       OR5: COL in case of override category   a: LI   b: aLI
       **:   A connected subaddress may be received from the MS
       info: information   SI: screening indicator   aSI: additional screening indicator
       req: request   PI: presentation indicator
       ack: acknowledge LI: line identity   aLI: additional line identity

3.3 Information stored in the HLR

COLP may have the following logical states (refer to 3G TS 23.011 for an explanation of the notation):

Provisioning State	Registration State	Activation State	HLR Induction State
(Not Provisioned,	Not Applicable,	Not Active,	Not Induced)
(Provisioned,	Not Applicable,	Active and Operative,	Not Induced)

The HLR shall store the logical state of COLP (which shall be one of the valid states listed above) on a per subscriber basis.

The HLR shall also store the subscription option "override category" on a per subscriber basis.

This parameter takes one of the following values:

- yes;

- no.

3.4 State transition model

The following figure shows the successful cases of transition between the applicable logical states of COLP. The state changes are caused by actions of the service provider.

Note that error cases are not shown in the diagram as they normally do not cause a state change. Additionally, some successful requests may not cause a state change. Hence they are not shown in the diagram.
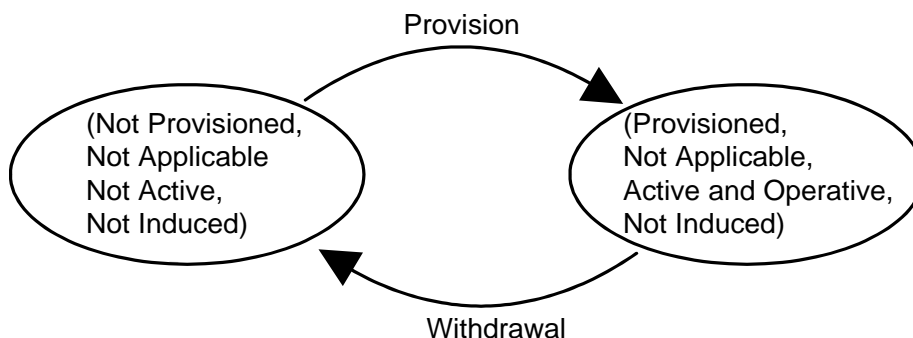

Figure 3.6: State transition model for COLP

3.5 Transfer of information from HLR to VLR

If the provisioning state for COLP is "Provisioned" then, when the subscriber registers on a VLR, the HLR shall send that VLR information about the logical state of COLP. The HLR shall send the override category if the VLR is in the HPLMN country. The HLR may send the override category if the VLR is outside the HPLMN country.

If the logical state of COLP or the override category is changed while a subscriber is registered on a VLR then the HLR shall inform the VLR of the new logical state of COLP. If the override category is changed and the provisioning state of COLP is "Provisioned" then the HLR shall inform the VLR about the new override category when the VLR is in the HPLMN country. The HLR may inform the VLR about the new override category when the VLR is outside of the HPLMN country.

3.6 Information stored in the VLR

For COLP, the VLR shall store the service state information and override category received from the HLR.

If not received from the HLR (case of roaming outside the HPLMN country), the override category shall be set to the default value "no".

3.7 Handover

Handover will have no impact on the control procedures and the operation of the service.

4 Connected line identification restriction (COLR)

4.1 Handling of connected line identification restriction

4.1.1 General

If the terminating party has connected line identification restriction provisioned and it is impossible to indicate to the originating network (due to interworking) that the number should not be presented to the originating party, the connected line identity shall not be delivered to the originating network.

4.1.2 Interrogation

Status check

The mobile subscriber can request the status of the supplementary service and be informed if the service is provided to him/her. This procedure is illustrated in figure 4.1.
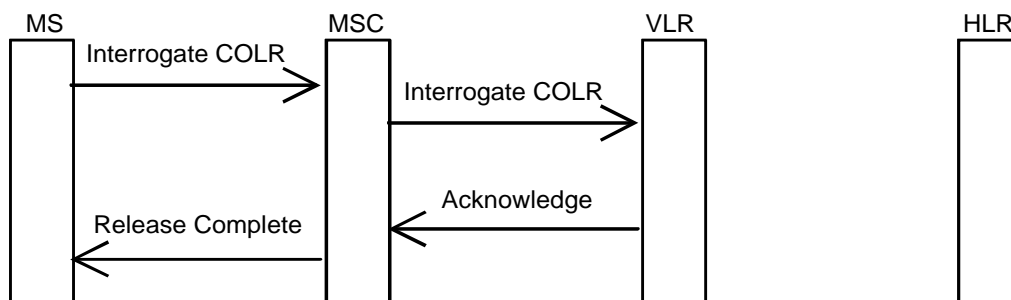

Figure 4.1: Interrogation of connected line identification restriction

4.2 Functions and information flows

The following Mobile Additional Functions have been identified for the PLMN:

MAF040

Determination of the connected line identification restriction subscription

The ability of a PLMN component to determine whether the supplementary service is provisioned for the mobile subscriber. See figure 4.2.

Location: VLR.
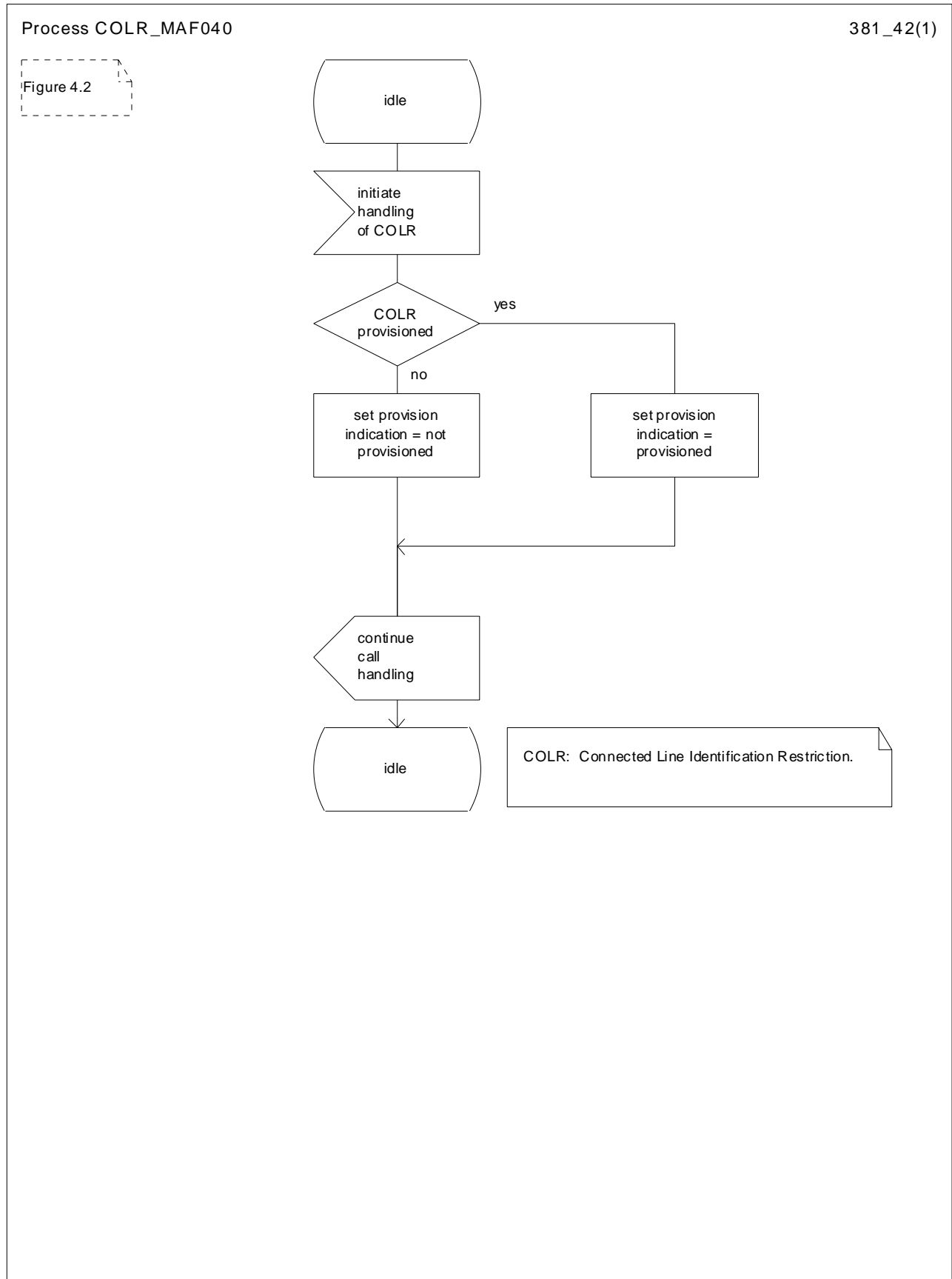
MAF041

Determination of the connected party number for offering to the calling party

The ability of a PLMN component to determine and to forward the connected line identity and related indications to the calling party. See figure 4.3.

Location: terminating MSC.

The information flow is shown in figures 4.4.

Process COLR_MAF040 381_42(1)

Figure 4.2

idle

initiate
handling
of COLR

COLR
provisioned — yes

no

set provision
indication = not
provisioned

set provision
indication =
provisioned

continue
call
handling

idle

COLR: Connected Line Identification Restriction.

**Figure 4.2: MAF040 Determination of connected line identification restriction subscription
(VLR)**

Process COLR_MAF041 381_43(1)

Figure 4.3

idle

initiate
handling
of COLR

COLR
provisioned → no

yes

set PI =
presentation
restricted

set PI =
presentation
allowed

continue
call
handling

COLR: Connected Line Identification Restriction.
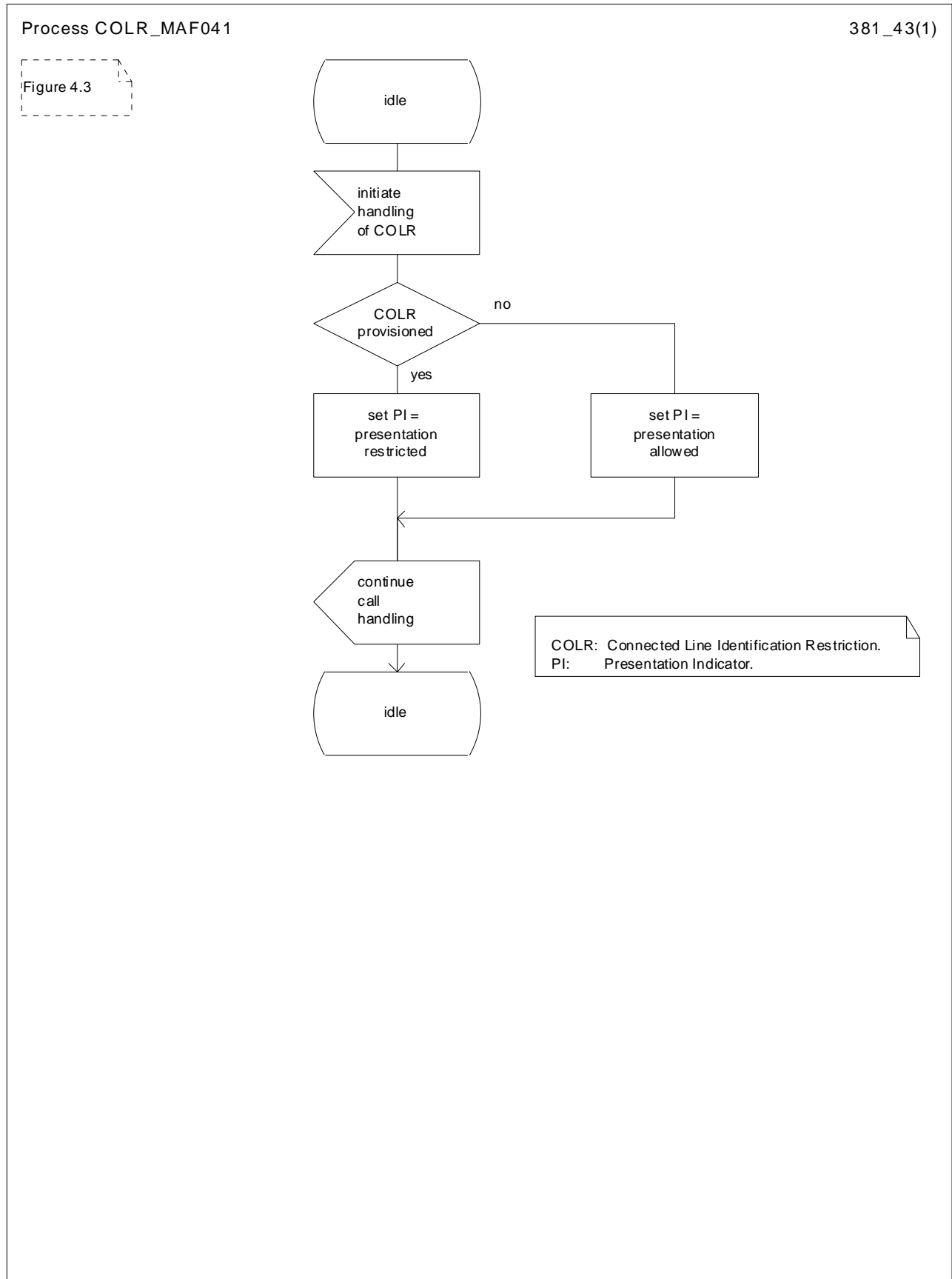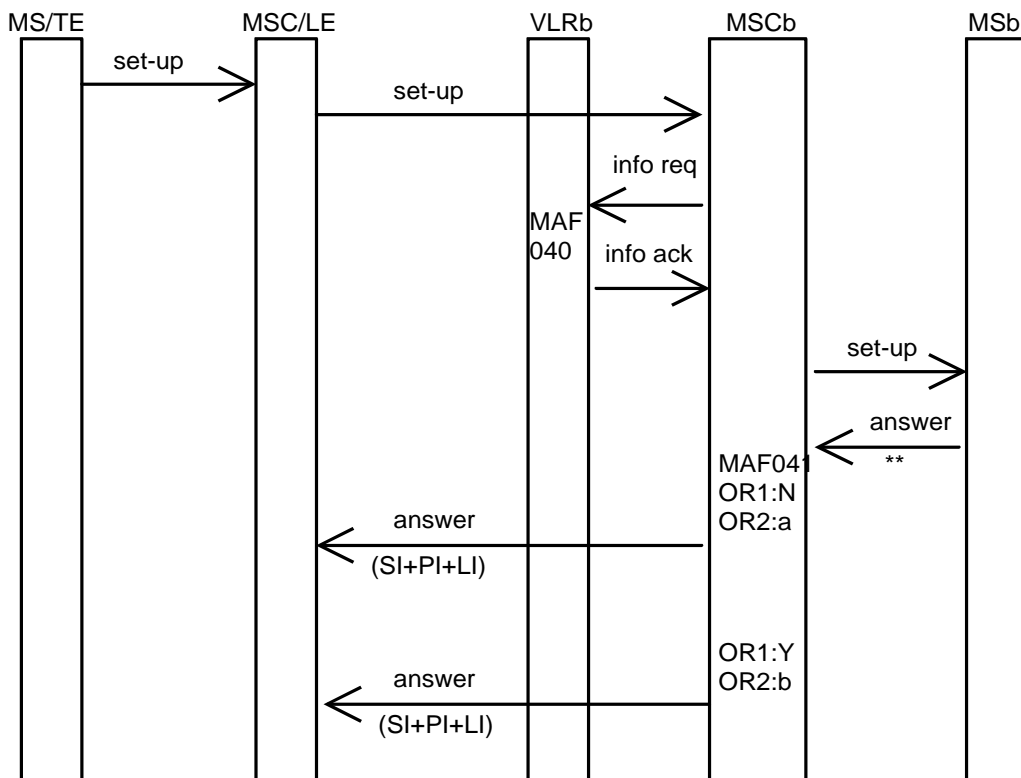PI: Presentation Indicator.

idle

Figure 4.3: MAF041 Determination of the presentation indicator

**Figure 4.4: Information flow for connected line identification restriction:
mobile station or fixed terminal to mobile station**

NOTE: OR1: COLR provisioned Y: yes N: no
OR2: Presentation Indicator Value a: allowed
b: restricted
OR3: Override category
**: A subaddress may be received from the MS
info: information SI: screening indicator
req: request PI: presentation indicator
ack: acknowledge LI: line identity

4.3 Information stored in the HLR

COLR may have the following logical states (refer to 3G TS 23.011 for an explanation of the notation):

Provisioning State	Registration State	Activation State	HLR Induction State
(Not Provisioned,	Not Applicable,	Not Active,	Not Induced)
(Provisioned,	Not Applicable,	Active and Operative,	Not Induced)

The HLR shall store the logical state of COLR (which shall be one of the valid states listed above) on a per subscriber basis.

4.4 State transition model

The following figure shows the successful cases of transition between the applicable logical states of COLR. The state changes are caused by actions of the service provider.

Note that error cases are not shown in the diagram as they normally do not cause a state change. Additionally, some successful requests may not cause a state change. Hence they are not shown in the diagram.
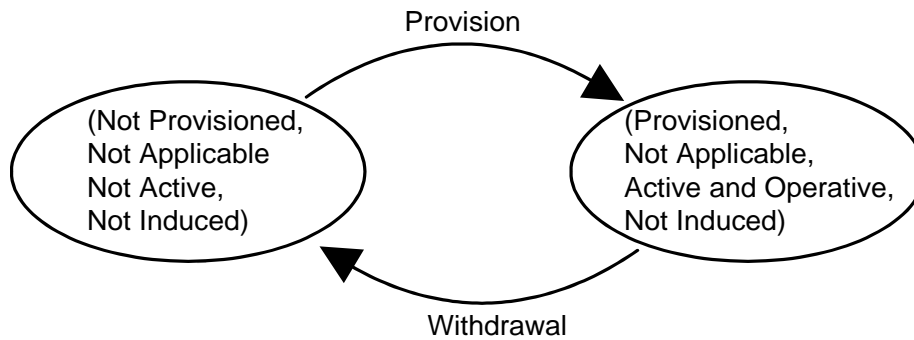
Figure 4.5: State transition model for COLR

4.5 Transfer of information from HLR to VLR

When the subscriber registers on a VLR, the HLR shall send that VLR information about the logical state of COLR.

If the logical state of COLR is changed while a subscriber is registered on a VLR then the HLR shall inform the VLR of the new logical state of COLR.

4.6 Information stored in the VLR

For COLR, the VLR shall store the service state information received from the HLR.

4.7 Handover

Handover will have no impact on the control procedures and the operation of the service.

4.8 Interworking

The VPLMN needs to distinguish three cases in order to meet data privacy requirements in an environment where support of COLP and COLR is optional:

    a) the HPLMN supports COLR, and COLR is provisioned for the subscriber;

    b) the HPLMN supports COLR, but COLR is not provisioned for the subscriber;

    c) the HPLMN does not support COLR.

In case a) the VPLMN must apply the COLR subscription as indicated by the data sent by the HPLMN.

In case b) the VPLMN must not apply COLR.

In case c) the VPLMN must apply an implicit COLR subscription.

To allow the VPLMN to make this distinction, the HLR and VLR behave as follows:

-    If the HLR supports COLR, but COLR is not provisioned for the subscriber, the HLR shall inform the VLR that COLR is not provisioned.

-    If the VLR supports COLR, but the HLR does not support COLR, the VLR shall behave in the same way as if COLR was provisioned for the subscriber, i.e. the connected line identity shall not be displayed to the calling subscriber unless the calling subscriber has COLR override capability. When interrogating the service status the subscriber shall be informed that COLR is provided to him and is active.

Annex A (informative):
Mapping of CLI

This annex defines the mapping rules of CLI parameters received via the NW-NW interface to CLI parameters to be sent to the MS.

	Information received over the NW-NW interface					Information sent to the MS		
	presentation indicator	line identity	additional presentation indicator	additional line identity	Cause of No CLI	presentation indicator	line identity	Cause of No CLI
CLIP not pro-vision-ed	*	*	*	*	*	-	-	-
CLIP provisioned without override category	-	-	-	-	-	not available	-	-
	not available	-	-	-	-	not available	-	-
	allowed	digits	-	-	-	allowed	digits of line identity	-
	allowed	digits	+	digits	-	allowed	digits of additional line identity	-
	restricted	digits	*	*	-	restricted	-	-
	restricted	digits	*	*	unavailable	restricted	-	unavailable
	restricted	digits	*	*	reject by user	restricted	-	reject by user
	restricted	digits	*	*	interaction with other service	restricted	-	interaction with other service
	restricted	digits	*	*	payphone	restricted	-	payphone
	restricted by network	digits	-	-	-	not available	-	-
	restricted by network	digits	allowed	digits	-	allowed	digits of additional line identity	-

	Information received over the NW-NW interface					Information sent to the MS		
	presentation indicator	line identity	additional presentation indicator	additional line identity	Cause of No CLI	presentation indicator	line identity	Cause of No CLI
CLIP provisioned without override category	-	-	-	-	-	not available	-	-
	not available	-	-	-	-	not available	-	-
	allowed	digits	-	-	-	allowed	digits of line identity	-
	allowed	digits	+	digits	-	allowed	digits of additional line identity	-
	restricted	digits	-	-	-	restricted	digits of line identity	-
	restricted	digits	+	digits	-	restricted	NOTE 1	-
	restricted	digits	+	digits	unavailable	restricted	NOTE 1	unavailable
	restricted	digits	+	digits	reject by user	restricted	NOTE 1	reject by user
	restricted	digits	+	digits	interaction with other service	restricted	NOTE 1	interaction with other service
	restricted	digits	+	digits	payphone	restricted	NOTE 1	payphone
	restricted	digits	-	-	unavailable	restricted	digits of line identity	unavailable
	restricted	digits	-	-	reject by user	restricted	digits of line identity	reject by user
	restricted	digits	-	-	interaction with other service	restricted	digits of line identity	interaction with other service
	restricted	digits	-	-	payphone	restricted	digits of line identity	payphone
	restricted by network	digits	-	-	-	restricted	digits of line identity	-
	restricted by network	digits	allowed	digits	-	allowed	digits of additional line identity	-

-   parameter not present
*   parameter absent or present, if present it may have any value
+   parameter present, it may have any value

NOTE 1: Network Option to send either digits of the line identity or digits of additional line identity applies.

Annex B (informative): Change history

Change history						
TSG CN#	**Spec**	**Version**	**CR**	**<Phase>**	**New Version**	**Subject/Comment**
Apr 1999	GSM 03.81	7.0.0				Transferred to 3GPP CN1
CN#03	23.081			R99	3.0.0	Approved at CN#03
	23.081	3.0.0		R99	3.0.1	Upgrade of references from 2G to 3G
CN#08	23.081	3.0.1		R99	3.1.0	Enhanced handling of presentation indicators for CLIP
CN#11	23.081	3.1.0		Rel-4	4.0.0	Release 4 after CN#11
CN#16	23.081	4.0.0		Rel-5	5.0.0	Release 5 after CN#16

History

Document history		
V5.0.0	June 2002	Publication