3GPP TSG CN Plenary **Tdoc NP-000639**
Meeting #10, Bangkok, Thailand
6ᵗʰ – 8ᵗʰ December 2000

Source: **TSG_CN WG 4**

Title: **CRs to R99 Work Item ASCI**

Agenda item: **7.9**

Document for: **APPROVAL**

Introduction:

This document contains 4 CRs on R99 Work Item ASCI, that have been agreed by TSG_CN WG4, and is forwarded to TSG_CN Plenary meeting #10 for approval.

SMG#	TDoc	SPEC	CR	RE	PHAS	VERS	SUBJECT	CAT
CN10	N4-001086	24.067	001	1	R99	3.0.0	CR 24.067 on eMLPP correction for GSM/UMTS use	F
CN10	N4-001111	23.067	002	2	R99	3.1.0	The accepted priority in the call proceeding message	F
CN10	N4-001118	24.067	002	3	R99	3.0.0	The accepted priority in the call proceeding message for GSM and UMTS	F
CN10	N4-001094	23.067	008	1	R99	3.1.0	Correction of Pre-emption service (eMLPP)	F

3GPP TSG-CN WG4
CN4 meeting #5,Paris,
13-17 November 2000

Document **N4-001111**

Revision of N4-001084,
N4-000932

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.067	CR	**002r2**	Current Version:	**3.1.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ ↑ *CR number as allocated by MCC support team*

For submission to: **CN#10**
list expected approval meeting # here ↑

for approval **X**
for information ☐

strategic ☐
non-strategic ☐

(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network **X**

Source:	CN4		**Date:**	15/11/2000

Subject:	The accepted priority in the CALL PROCEEDING message

Work item:	ASCI

Category:

(only one category shall be marked with an X)

F	Correction	**X**	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	☐
Release 96	☐
Release 97	☐
Release 98	☐
Release 99	**X**
Release 4	
Release 5	☐

Reason for change:	**CR supported by consensus in the CN4 meeting:** The purpose is to include priority in the CALL PROCEEDING message if the network is supporting eMLPP.

Clauses affected:	11.6

Other specs affected:

Other 3G core specifications	☐ → List of CRs:	
Other GSM core specifications	☐ → List of CRs:	24.067-002
MS test specifications	☐ → List of CRs:	
BSS test specifications	☐ → List of CRs:	
O&M specifications	☐ → List of CRs:	

Other comments:	

help.doc

<--------- double-click here for help and instructions on how to create a CR.

11.6   Overview of call related signalling

In this overview, the message structure to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the transport procedures to be used to carry the priority information in case of standard point-to-point calls are given in figures 1 to 6. The message flow is not represented completely.

The corresponding message flows in case of voice group calls or voice broadcast calls are given in GSM 03.68 and GSM 03.69, respectively.
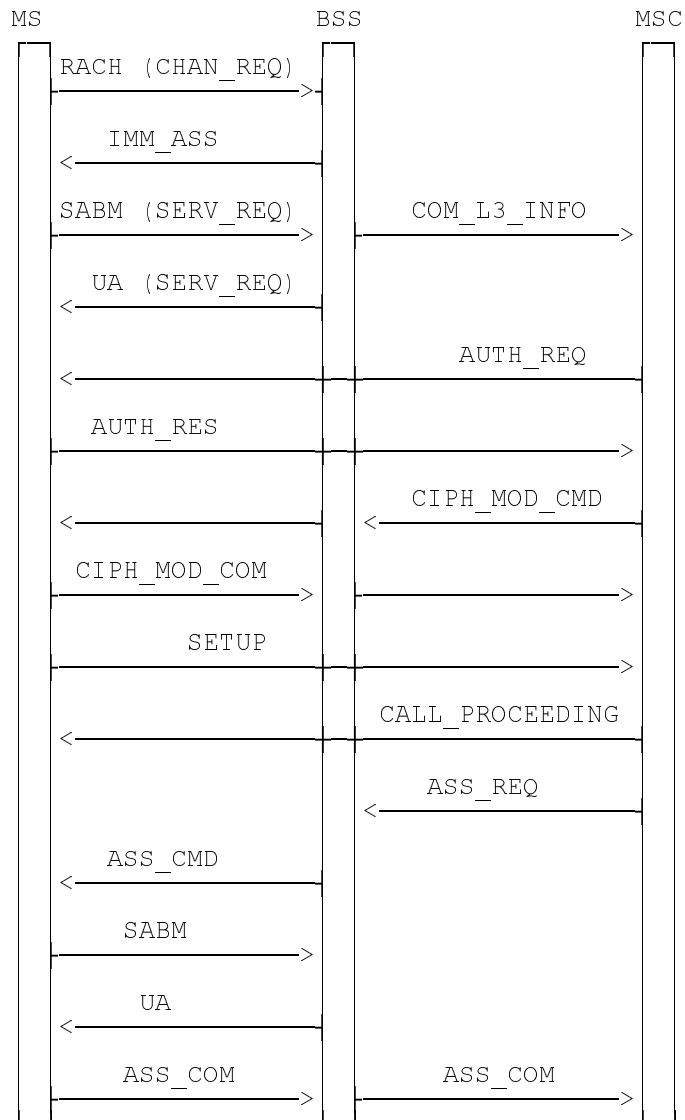
```
        MS                    BSS                    MSC
         ┌─┐                  ┌─┐                    ┌─┐
         │ │  RACH (CHAN_REQ) │ │                    │ │
         │ ├─────────────────>│ │                    │ │
         │ │      IMM_ASS      │ │                    │ │
         │ │<─────────────────┤ │                    │ │
         │ │  SABM (SERV_REQ) │ │    COM_L3_INFO      │ │
         │ ├─────────────────>│ ├───────────────────>│ │
         │ │   UA (SERV_REQ)   │ │                    │ │
         │ │<─────────────────┤ │                    │ │
         │ │                   │ │     AUTH_REQ        │ │
         │ │<─────────────────────────────────────────┤ │
         │ │     AUTH_RES       │ │                    │ │
         │ ├─────────────────────────────────────────>│ │
         │ │                   │ │   CIPH_MOD_CMD      │ │
         │ │<─────────────────┤ │<───────────────────┤ │
         │ │  CIPH_MOD_COM     │ │                    │ │
         │ ├─────────────────>│ ├───────────────────>│ │
         │ │      SETUP         │ │                    │ │
         │ ├─────────────────────────────────────────>│ │
         │ │                   │ │  CALL_PROCEEDING    │ │
         │ │<─────────────────┤ │                    │ │
         │ │                   │ │     ASS_REQ         │ │
         │ │                   │ │<───────────────────┤ │
         │ │     ASS_CMD        │ │                    │ │
         │ │<─────────────────┤ │                    │ │
         │ │      SABM          │ │                    │ │
         │ ├─────────────────>│ │                    │ │
         │ │       UA           │ │                    │ │
         │ │<─────────────────┤ │                    │ │
         │ │     ASS_COM        │ │     ASS_COM         │ │
         │ ├─────────────────>│ ├───────────────────>│ │
         └─┘                  └─┘                    └─┘
```
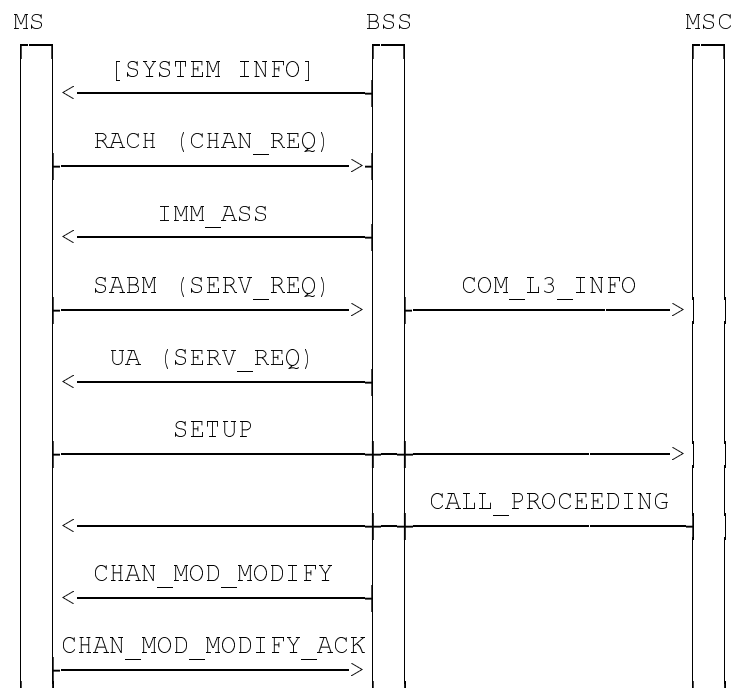
Figure 1A: Signalling information required for the prioritisation at mobile originating call establishment without fast call set-up

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message.

SABM (SERV_REQ): Modified form of the current L3-MM CM SERVICE REQUEST where the priority level is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible Mobile Station the Mobile Station shall send a standard service request message and the network shall apply a default priority to their request.

UA (SERV_REQ): Standard message.

COM_L3_INFO: The MSC is provided with initial information about the requested service together with the selected priority level if applicable.

AUTH_REQ: Standard message.

AUTH_RES: Standard message.

CIPH_MOD_CMD: Standard message.

CIPH_MOD_COM: Standard message.

SETUP: Standard message.

CALL_PROCEEDING: The network ~~may~~shall include the assigned priority level in a CALL_PROCEEDING message~~.~~ ~~if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is~~ ~~different to the one requested, or to confirm that the priority send by the MS in the CM_SERVICE_REQUEST message~~ ~~is accepted.~~ If the MS has indicated the priority in the CM_SERVICE_REQUEST message and if no priority level is included in the CALL_PROCEEDING message, then the MS shall assume that the network doesn't support priority.

ASS_REQ: This message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the service request or from the VLR data. In addition, the eMLPP level is included as explicit information.

ASS_CMD: Standard message.

SABM: Standard message.

UA: Standard message.

ASS_COM: Standard message.

Figure 2: Signalling information required for the prioritisation at mobile originating call establishment with fast call set-up

For further study:

> ***SYSTEM INFO:*** *The network may provide information on the BCCH system information, that a MM connection is provisional granted after establishment of the main signalling link.*

> *If such information is provided on the BCCH and the user has selected a fast call set-up, the Mobile Station shall immediately send a SETUP message to the network after the main signalling link is established.*

Initial RACH CHAN_REQ: Standard message.

For further study:

> *A new establishment cause shall be provided to indicate the requirement for the direct assignment of a TCH (very early assignment) for the support of fast call set-up procedure.*

IMM_ASS: Standard message.

SABM (SERV_REQ): Modified form of the current L3-MM CM SERVICE REQUEST where the priority level is provided in addition if a priority selection is performed by the user.

UA (SERV_REQ): Standard message.

COM_L3_INFO: The MSC is provided with initial information about the requested service together with the selected priority level if applicable.

If the network itself decides not to perform ciphering, it shall send an CM_SERV_ACC message.

SETUP: Standard message.

CALL_PROCEEDING: The network ~~may should~~ shall include the assigned priority level in a CALL_PROCEEDING message~~.~~ ~~if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested, or to confirm that the priority send by the MS in the CM_SERVICE_REQUEST message is accepted. If the MS has indicated the priority in the CM_SERVICE_REQUEST message and I~~if no priority level is included in the CALL_PROCEEDING message, then the MS shall assume that the network doesn't support priority.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the service request or from the VLR data. In addition, the eMLPP level is included as explicit information.

CHAN_MOD_MODIFY: Standard message.
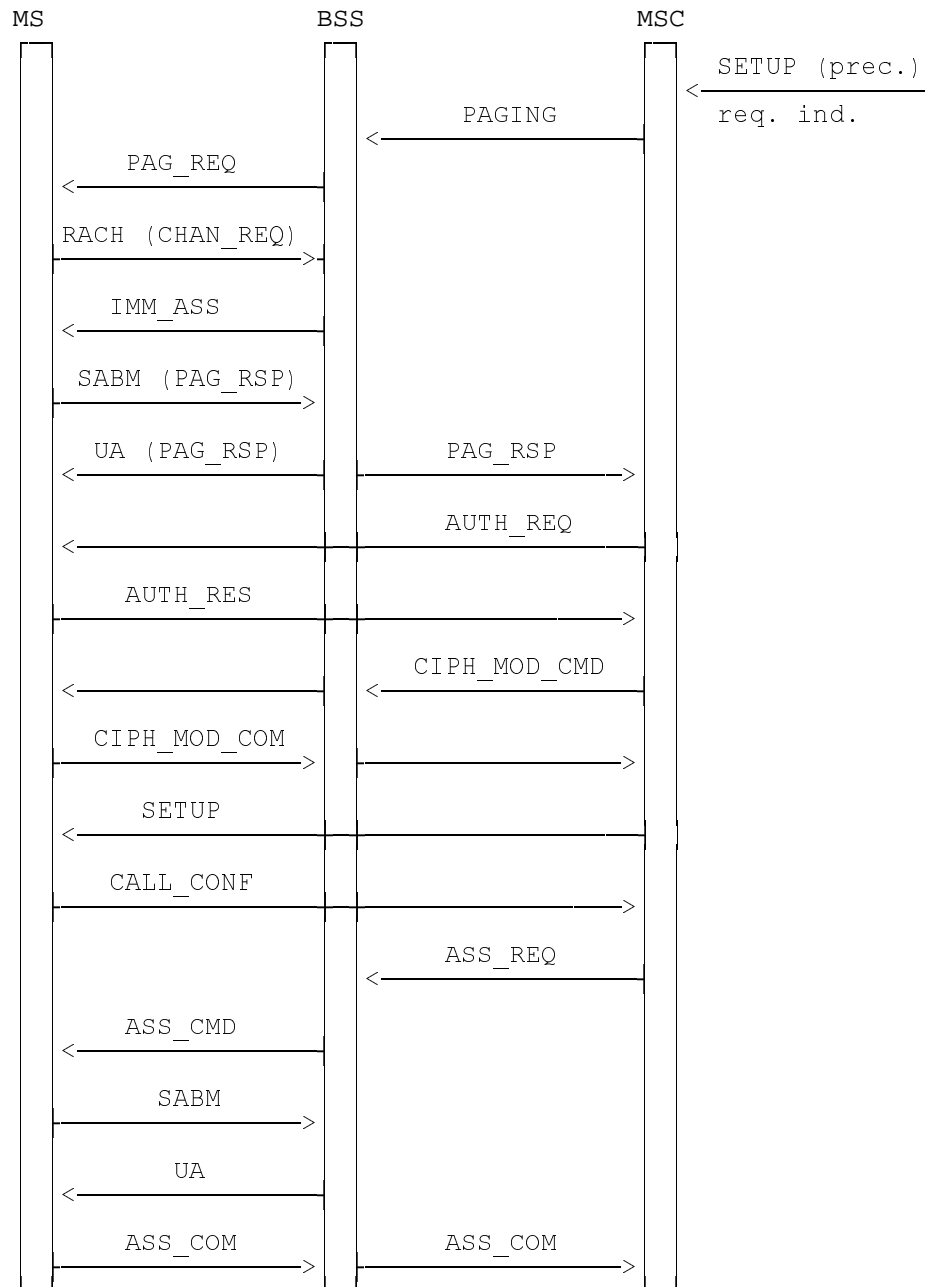
CHAN_MOD_MODIFY_ACK: Standard message.

```
         MS                   BSS                  MSC
         ┌┐                   ┌┐                   ┌┐
         ││                   ││                   ││   SETUP (prec.)
         ││                   ││                   │├<─────────────────
         ││                   ││    PAGING         ││   req. ind.
         ││                   │├<──────────────────┤│
         ││   PAG_REQ         ││                   ││
         │├<──────────────────┤│                   ││
         ││ RACH (CHAN_REQ)   ││                   ││
         │├───────────────────>│                   ││
         ││   IMM_ASS          ││                   ││
         │├<──────────────────┤│                   ││
         ││ SABM (PAG_RSP)    ││                   ││
         │├───────────────────>│                   ││
         ││ UA (PAG_RSP)      ││    PAG_RSP        ││
         │├<──────────────────┤├───────────────────>│
         ││                   ││    AUTH_REQ       ││
         │├<──────────────────────────────────────┤│
         ││   AUTH_RES        ││                   ││
         │├────────────────────────────────────────>│
         ││                   ││   CIPH_MOD_CMD    ││
         │├<──────────────────┤├<──────────────────┤│
         ││  CIPH_MOD_COM     ││                   ││
         │├───────────────────>├───────────────────>│
         ││   SETUP           ││                   ││
         │├<──────────────────┤├───────────────────┤│
         ││  CALL_CONF        ││                   ││
         │├───────────────────┤├───────────────────>│
         ││                   ││    ASS_REQ        ││
         ││                   │├<──────────────────┤│
         ││   ASS_CMD         ││                   ││
         │├<──────────────────┤│                   ││
         ││   SABM            ││                   ││
         │├───────────────────>│                   ││
         ││   UA              ││                   ││
         │├<──────────────────┤│                   ││
         ││   ASS_COM         ││    ASS_COM        ││
         │├───────────────────>├───────────────────>│
         └┘                   └┘                   └┘
```
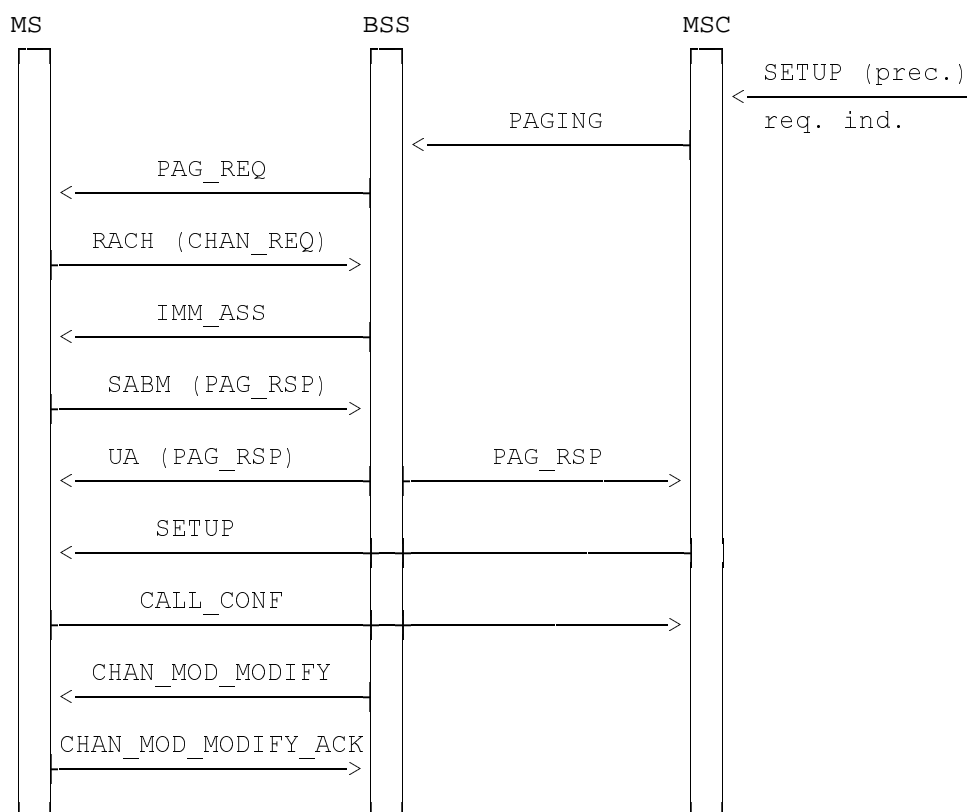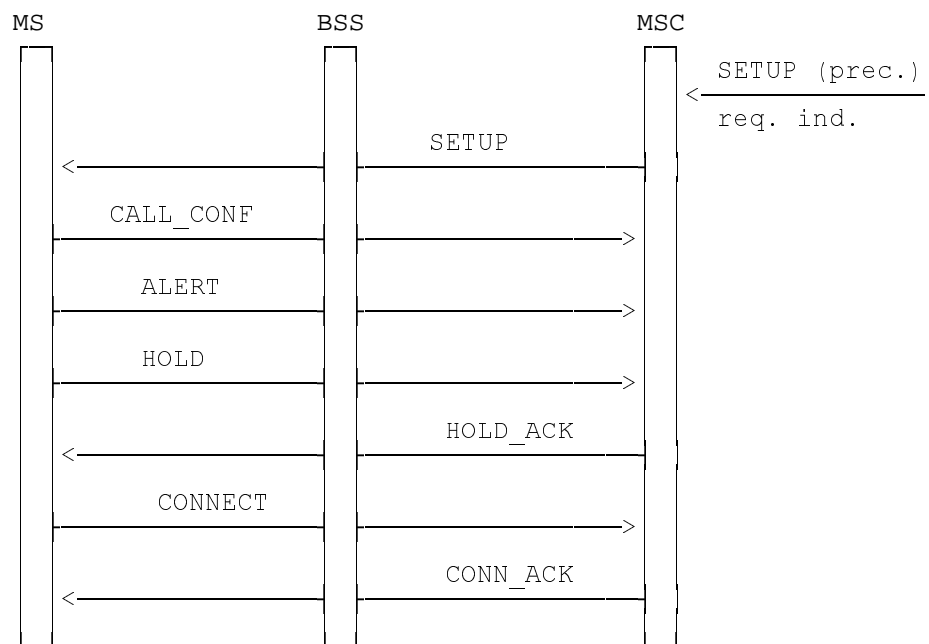
**Figure 3: Signalling information required for the prioritisation at mobile terminating call
establishment without fast call set-up and without called-party pre-emption**

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

PAGING: Modified paging command including the priority level to be applied.

PAG_REQ: Modified paging message including the related priority level.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message.

SABM (PAG_RSP): Standard message.

UA (PAG_RSP): Standard message.

PAG_RSP: Standard message.

AUTH_REQ: Standard message.

AUTH_RES: Standard message.

CIPH_MOD_CMD: Standard message.

CIPH_MOD_COM: Standard message.

SETUP: Standard message.

CALL_CONF: Standard message.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the incoming set-up message. In addition, the eMLPP level is included as explicit information.

ASS_CMD: Standard message.

SABM: Standard message.

UA: Standard message.

ASS_COM: Standard message.

Figure 4: Signalling information required for the prioritisation at mobile terminating call establishment with fast call set-up and without called-party pre-emption

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

PAGING: Modified paging command including the priority level to be applied.

PAG_REQ: Modified paging message including the related priority level.

Initial RACH CHAN_REQ: Standard message. A new establishment cause shall be provided to indicate the requirement for the direct assignment of a TCH (very early assignment) for the support of fast call set-up procedure.

IMM_ASS: Standard message.

SABM (PAG_RSP): Standard message.

UA (PAG_RSP): Standard message.

PAG_RSP: Standard message.

For fast call set-up the network shall immediately send a SETUP message to the Mobile Station. Authentication and ciphering may not be performed or delayed by the network.]

SETUP: Modified message with an indication of the priority level.

CALL_CONF: Standard message.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from incoming set-up message. In addition, the eMLPP level is included as explicit information.

CHAN_MOD_MODIFY: Standard message.

CHAN_MOD_MODIFY_ACK: Standard message.

Figure 5: Signalling information required for the called-party pre-emption in case of an existing telephony call and subscription for HOLD

Call Waiting should always be subscribed together with eMLPP. If not, no called party pre-emption is possible for point-to-point calls.

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

SETUP: Modified SETUP message with an indication of the priority level.

CALL_CONF: Standard message with cause user busy.

On reception of the SETUP message a compatible Mobile Station decides on called party pre-emption. If called party pre-emption applies, the Mobile Station shall automatically accept the waiting call and put the other call on hold.

A non compatible Mobile Station shall not be harmed by the priority information and shall perform Call Waiting functions as normal.

ALERT: Standard message. ALERTING may be omitted in case of called party pre-emption.

HOLD: Standard message.

HOLD_ACK: Standard message.

CONNECT: Standard message.

CONN_ACK: Standard message.

    NOTE: In case of an incoming data call a mode modify procedure has to be performed which is not included in figure 5.
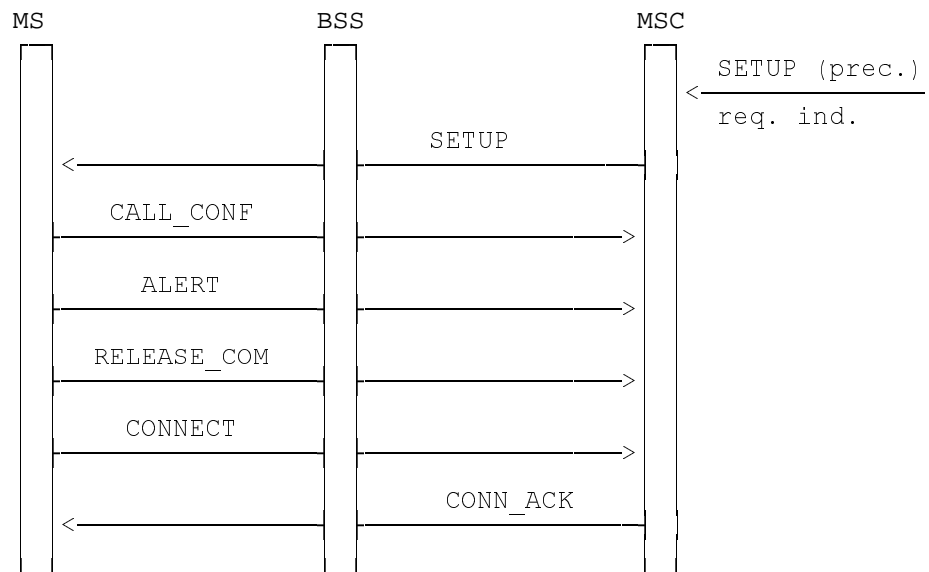
```
        MS                    BSS                   MSC
         ┌─┐                   ┌─┐                   ┌─┐
         │ │                   │ │                   │ │   SETUP (prec.)
         │ │                   │ │                   │ │<──────────────
         │ │                   │ │        SETUP      │ │   req. ind.
         │ │<─────────────────────────────────────────│ │
         │ │      CALL_CONF    │ │                   │ │
         │ │──────────────────────────────────────────>│ │
         │ │       ALERT       │ │                   │ │
         │ │──────────────────────────────────────────>│ │
         │ │    RELEASE_COM    │ │                   │ │
         │ │──────────────────────────────────────────>│ │
         │ │      CONNECT      │ │                   │ │
         │ │──────────────────────────────────────────>│ │
         │ │                   │ │      CONN_ACK     │ │
         │ │<─────────────────────────────────────────│ │
         └─┘                   └─┘                   └─┘
```

Figure 6: Signalling information required for the called-party pre-emption in case of point-to-point data calls or no subscription for HOLD

Call Waiting should always be subscribed together with eMLPP. If not, no called party pre-emption is possible for point-to-point calls.

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

SETUP: Modified SETUP message with an indication of the priority level.

CALL_CONF: Standard message with cause user busy.

On reception of the SETUP message a compatible Mobile Station decides on called party pre-emption. If called party pre-emption applies, the Mobile Station shall automatically accept the waiting call and clear the existing data call.

A non compatible Mobile Station shall not be harmed by the priority information and shall perform Call Waiting functions as normal.

ALERT: Standard message. ALERTING may be omitted in case of called party pre-emption.

RELEASE_COM: Standard message which shall be send immediately after the ALERT with a new cause for called party pre-emption.

CONNECT: Standard message.

CONN_ACK: Standard message.

Document **N4-001094**

CHANGE REQUEST

23.067 **CR** **008r1**   Current Version: **3.1.0**

For submission to: **CN#10**   for approval **X**   strategic ☐
                                      for information ☐   non-strategic ☐

Proposed change affects: (U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network **X**
(at least one should be marked with an X)

Source: CN4   **Date:**   2000-11-17

Subject: CR 23.067 on Correction of Pre-emption service (eMLPP)

Work item: ASCI

Category: F   Correction   **X**   **Release:**   Phase 2   ☐
               A   Corresponds to a correction in an earlier release   ☐   Release 96   ☐
               B   Addition of feature   ☐   Release 97   ☐
               C   Functional modification of feature   ☐   Release 98   ☐
               D   Editorial modification   ☐   Release 99   **X**
                                                                                                    Release 00   ☐

Reason for change: **Category: Critical correction**

This CR describes the following corrections.

-To be prepared for GSM/UMTS use, it is needed some inconsistency correction. E.g. it is needed to add the UMTS specified parts.

Clauses affected:

Other specs affected: Other 3G core specifications   ☐   → List of CRs:
                                   Other GSM core specifications   **X**   → List of CRs:
                                   MS test specifications   ☐   → List of CRs:
                                   BSS test specifications   ☐   → List of CRs:
                                   O&M specifications   ☐   → List of CRs:

Other comments:

1 Scope

The present document specifies the stage 2 description of the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) which provides different call priorities in combination with fast call set-up and pre-emption for different applications according to 3G TS 22.067.

2 References

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

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

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

- For a non-specific reference, the latest version applies.

[1]   3G TR 21.905: "3G Vocabulary".

[2]   3G TS 22.101: "UMTS Service Principles".

[3]   3G TS 22.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1".

[4]   3G TS 23.011:"Technical realization of supplementary services".

[5]   GSM 03.68: "Digital cellular telecommunications system (Phase 2+);Voice Group Call Service (VGCS) - Stage 2".

[6]   GSM 03.69: "Digital cellular telecommunications system (Phase 2+);Voice Broadcast Service (VBS) - Stage 2".

[7]   GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification".

[8]   ITU-T Recommendation Q.85: "Stage 2 description for community of interest supplementary services (clause 3: Multi-Level Precedence and Pre-emption MLPP)".

[9]   ITU-T Recommendation Q.735: "Stage 3 description for community of interest supplementary services using SS No. 7 (clause 3: Multi-Level Precedence and Pre-emption (MLPP)".

[10]   3G TS 25,331: "RRC Protocol Specification".

[11]   3G TS 25.431: "UTRAN Iu Interface RANAP Signalling".

[12]   3G TS 24.008: "Core Network Protocols - Stage 3".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions, also defined in 3G TS 22.067, apply:

For the purposes of the present document, the terms and definitions given in 3G TS 22.067 and the following apply:

resource pre-emption: the termination of a call of a low priority user such that resources can be made available for a precedence call of higher priority. Resource pre-emption could be initiation resource pre-emption or handover resource pre-emption

called-party pre-emption: termination of a call to a particular user when a higher priority call is directed towards that specific user. Called party pre-emption is decided by the Mobile Station. In case of point-to-point calls, this shall be performed by Call Waiting with automatic acceptance of the waiting call by the Mobile Station

compatible Mobile Station: mobile stations which support eMLPP and therefore have precedence and pre-emption capabilities

non-compatible Mobile Station: mobile stations which do not support eMLPP

SIM: subscriber Identity Module. This specification makes no distinction between SIM and USIM.

Handover: This specification uses the term handover for GSM and the same term meaning relocation in UMTS

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3G TR 21.905 and the following apply:

eMLPP   enhanced Multi-Level Precedence and Pre-emption
VBS   Voice Broadcast Service
VGCS   Voice Group Call Service

4 Main concepts

The enhanced Multi-Level Precedence and Pre-emption service (eMLPP) provides different levels of precedence for call set-up and for call continuity in case of handover.

There are seven priority levels which are defined in 3G TS 22.067. The two highest levels are reserved for network internal use. These two levels can only be used locally, i.e. in the domain of one MSC. The other five priority levels are offered for subscription and can be applied globally, e.g. on inter switch trunks, if supported by all related network elements, and also for interworking with ISDN networks providing the MLPP service.

The seven priority levels are defined as follows:

A   (highest, for network internal use)

B   (for network internal use)

0   (for subscription)

1   (for subscription)

2   (for subscription)

3   (for subscription)

4   (lowest, for subscription).

Levels A and B shall be mapped to level 0 for priority treatment outside of the MSC area in which they are applied.

As a network specific configuration, the ability to pre-empt other calls of lower priority and the application of fast call set-up procedures can be assigned to each priority level. An example for an eMLPP configuration is given in 3G TS 22.067.

NOTE 1: The present specification defines the concepts for handling of priorities in the network including the indication whether pre-emption or fast call set-up procedures are to be applied. Note that the call set-up procedures themselves are specified in the corresponding stage 2 descriptions of the services where they are to be used. There is presently only a requirement for VBS and VGCS (GSM 03.69 and GSM 03.68, respectively).

NOTE 2: The network operator has to assure that the particular eMLPP configuration he applies and the subscriptions he issues are co-ordinated with the network planning (especially for blocking) and the implementation options applied (e.g. the use of OACSU) in order to guarantee the service performance for the subscriber.

Considering aspects of priority handling, the following issues can be considered for each call:

a) contention during the initial random access (no specific definitions apply for eMLPP. Delays due to access collision have to be managed by a corresponding planning of the network resources);

b) ~~b) in GSM,~~ contention in gaining radio resources during the call set-up phase and during handover (this item relates to the assignment of SDCCH and TCH for which queuing and pre-emption mechanisms are applied for eMLPP);

in UMTS, contention in gaining radio resources during the call set-up phase and during relocation (this item relates to the assignment of DCCH and DTCH for which queuing and pre-emption mechanisms are applied for eMLPP);

A pre-emption might already be performed as a network option on the basis of the establishment cause if a network specific eMLPP configuration assigns a certain priority level to a particular establishment cause.

c) contention in gaining terrestrial resources inside the GSM or UMTS network (this item relates to the assignment of terrestrial channels between the GSM or UMTS network nodes. Priority actions shall be performed on basis of the MLPP service implementations. The eMLPP priority levels A and B shall be mapped to the MLPP priority level 0. No further specific definitions apply for eMLPP);

d) contention in gaining terrestrial resources in external networks (this item relates to interworking with external networks which shall be performed on basis of the MLPP service if provided in the related external networks.);

e) application of different call set-up procedures in relation to the priority levels and the network specific configuration (three classes of set-up performance are defined in 3G TS 22.067, one very fast class for VBS or VGCS emergency call services, one class for fast but normal set-up times and one class allowing some delay in the set-up. The application of the corresponding procedures shall be decided by the network on the basis of the requested priority level);

f) automatic answering of calls if the incoming call is of or exceeds a defined priority level, respectively, or called party pre-emption (if the called ~~GSM~~ subscriber is engaged in communication of a lower priority);

g) the means by which the called user is informed of priority issues and is able to make appropriate decisions if no called party pre-emption applies;

h) the accommodation of non-compatible Mobile Stations.

The definitions in the present specification focus on the issues under item b), e), f), g) and h). Items c) and d) are related to the MLPP service implementation for the signalling system No. 7 according to ITU-T Recommendations Q.85 and Q.735.

For a call establishment, a subscriber shall be able to select any one of the priority levels he has subscribed to.

Priorities shall be treated in the network as defined in 3G TS 22.067. Priority treatment is different for point-to-point calls and voice broadcast calls or voice group calls, respectively:

- mobile originated point-to-point call:

The priority level depends on the calling subscriber. If the user has no eMLPP subscription, the call shall have a default priority level defined in the network. If the user has an eMLPP subscription, the call shall have the priority level selected by the user at set-up or the priority level predefined by the subscriber as default priority level by registration.

- mobile terminated point-to-point calls:

  The priority level depends on the calling party. For this, interworking with the ISDN MLPP service is required. If the call is not an MLPP call, i.e. no priority level is defined, the call shall be treated in the mobile network with a default priority level. If the call is an MLPP call, the call shall be treated with the priority level provided by the interfacing network.

- mobile to mobile point-to-point calls:

  The priority shall be treated for the calling subscriber as for mobile originated calls and for the called subscriber as for mobile terminated calls. However, an interworking with MLPP is not required if both the calling subscriber and the called subscriber are located in the same MSC area.

- Voice Broadcast Calls (VBS) and Voice Group Calls (VGCS):

  The link on the voice broadcast call channel or voice group call channel shall have the priority level as defined in the corresponding registration for the related voice broadcast call or voice group call in the GCR. At the early stage of a voice broadcast call or voice group call establishment, before the GCR request is made and the voice broadcast call channel or voice group call channels are assigned, the procedure shall be the same as for point-to-point calls.

Queuing and resource pre-emption shall then be applied as appropriate according to the network service configuration. In addition, automatic answering or called party pre-emption shall be applied as appropriated according to the Mobile Station's internal service configuration.

The MSC shall maintain a record of the priority level of each call in progress in its area such that it can arbitrate over resources in a defined manner.

The priority level can be included in the CM_SERVICE_REQUEST message in the case that a user establishing a point-to-point call is using a compatible Mobile Station (see clause 6).

If the subscriber has not selected a priority level for that call or uses a non compatible Mobile Station (see clause 6), the priority level shall be assigned according to the respective VLR data.

The priority level of a call shall be determined by the MSC. Accordingly, the MSC shall request channel assignment with an indication of the priority level and the pre-emption capability of that call. For this the MSC shall use the priority message element as defined in GSM 08.08. Mapping of the priority information in this message element on the network specific eMLPP configuration shall be performed in the MSC. Queuing and resource pre-emption shall be performed accordingly if necessary.

In GSM, Iin addition to the priority signalling, the requirement for a direct assignment of a TCH shall be included in the establishment cause of the CHAN_REQ message in order to support a fast call set-up procedure in the BSC at the earliest possible stage of the call establishment for high priority calls if applicable.

In UMTS, the otherin addition to the priority signalling, the RRC CONNECTION REQUEST message shall be included the establishment cause.

Automatic answering or, if necessary, called-party pre-emption has to be performed by the Mobile Station as defined in the following:

- point-to-point calls:

  If the user is in idle mode, the Mobile Station shall automatically connect to an incoming call of a sufficient priority level. The priority level shall be included in the paging message and in the set-up message. If the user is in dedicated mode and has a subscription to Call Waiting, a Call Waiting indication including the priority level of the call shall be given to the Mobile Station which automatically accepts the waiting call.

  There is no called party pre-emption for point-to-point calls without Call Waiting.

- voice group calls and voice broadcast calls:

  Notifications for other voice group calls, voice broadcast calls or information on paging for point-to-point calls shall be given to the Mobile Stations involved in on-going voice group calls or voice broadcast calls as defined in GSM 03.68 and GSM 03.69, respectively. The notifications include the related priority level of the call. In case of a notified call with higher priority where called-party pre-emption applies, the Mobile Station shall

automatically leave the on-going voice group call or voice broadcast call and react according to the type of the notified call type.

For both cases, the priority level applied shall be included, either in the paging message or Call Waiting indication, or in the notification message, in order to enable the Mobile Station to decide on an automatic reaction (automatic answering or called-party pre-emption) or to indicate the incoming, non pre-empting call to the user.

The priority information of the assignment request shall also be applied for BSS internal and also UTRAN internal handover. For external handover, the MSC shall include the priority information in the handover request according to the definition in GSM 08.08 (for GSM) and TS 25.431 (for UMTS) in the same way as for the assignment request.

5 General architecture

No specific requirements are identified.

6 Compatibility issues

eMLPP cannot be applied with standard GSM Phase 1 or Phase 2 Mobile Stations (non compatible Mobile Stations) with all service aspects. A dedicated Mobile Station (compatible Mobile Station) with eMLPP capability is required.

Specific functions a compatible Mobile Station shall provide are:

-   priority selection via MMI for call establishment in case of an eMLPP subscription including priority levels above level 4;

-   analysis of the priority level included in a paging message, Call Waiting indication or notification into a voice group call or voice broadcast call, respectively;

-   automatic reaction on basis of the analysed priority level in case of an incoming call while in dedicated mode, group transmit mode or group receive mode, respectively, according to the user defined Mobile Station configuration (for each subscribed priority level the user shall be able to configure the Mobile Station for automatic acceptation or indication or rejection of an incoming call);

    NOTE: Functions related to notifications are only required for Mobile Stations providing VBS or VGCS functions as defined in GSM 03.69 and GSM 03.68, respectively.

However, if eMLPP is provided in a network, it can be applied to non compatible Mobile Stations in the following way:

-   calls of subscribers which have no specific eMLPP subscription shall be treated for resource pre-emption with a default priority level.

This shall also apply independent of the use of compatible or non compatible Mobile Stations;

-   calls of eMLPP subscribers which use a non compatible Mobile Station shall be treated for resource pre-emption with the subscriber's default priority level;

-   calls to eMLPP subscribers which use a non compatible Mobile Station shall be indicated to the user by Call Waiting as normal.

7 Transmission

No specific requirements are identified.

8 Information storage

8.1 Stored in the HLR

Information concerning the maximum priority level which a subscriber is entitled to use at call establishment shall be stored in the HLR.

If the maximum priority level is above level 4, one level shall be indicated as default level. This default level shall be used for mobile originated calls if no priority selection is performed by the user at call establishment.

The default selection can be performed by the subscriber by means of a registration procedure.

> NOTE The priority levels in the subscription are related to point-to-point calls. VBS and VGCS calls are treated with the priority level defined in the GCR for a certain group ID in a certain group call area which can be different to the priority levels explicitly defined in the eMLPP subscription. However, these levels are then implicitly defined with the subscribed group IDs.

eMLPP 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 Registered,	Not Active	Not Induced)
(Provisioned,	Registered,	Active and Operative	Not Induced)

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

8.1.1 State transition model

The following figure shows the successful cases of transition between the applicable logical states of eMLPP. 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.
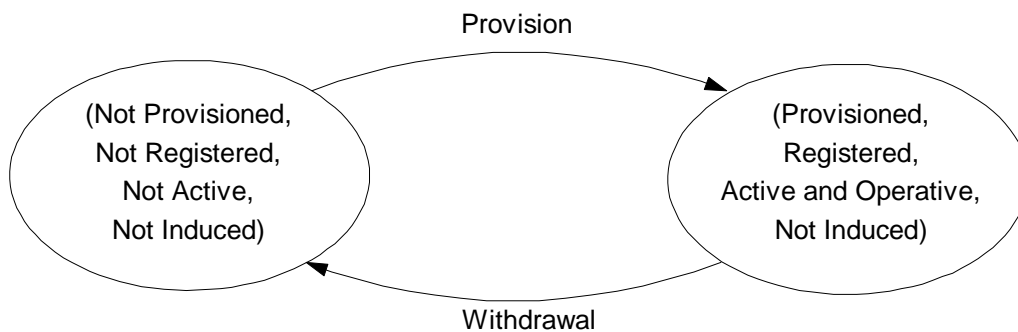
Figure 1: State transition model for eMLPP

8.1.2 Transfer of information from HLR to VLR

If the provisioning state for eMLPP is "Provisioned" then, when the subscriber registers on a VLR, the HLR shall send that VLR information about the logical state of eMLPP, the maximum priority level and the default priority level.

If any of the eMLPP subscriber data is changed, the HLR shall send to the VLR the complete eMLPP subscriber data.

8.2 Stored in the VLR

For eMLPP, the VLR shall store the service state information, the maximum priority level a subscriber is entitled to use and the default priority level received from the HLR.

8.3 Stored in the MSC

The network specific service configuration of eMLPP defined by the network operator as specified in 3G TS 22.067 shall be stored within each MSC. This includes information on resource pre-emption actions for any given levels of incoming and on-going call priority. An example for a network specific service configuration is given in 3G TS 22.067.

8.4 Stored in the SIM

Each compatible Mobile Station shall be aware of the automatic answering actions for any given levels of priority so that when in idle mode or dedicated mode or group receive mode or group transmit mode, it can decide on the necessary reactions to be taken according to the priority information of the incoming call.

For this, the SIM shall store the following data:

Priority level	Subscription available	Automatic answering applies	Fast set-up actions (note)
A	yes/no	yes/no	yes/no
B	yes/no	yes/no	yes/no
0	yes/no	yes/no	yes/no
1	yes/no	yes/no	yes/no
2	yes/no	yes/no	yes/no
3	yes/no	yes/no	yes/no
4	yes/no	--	yes/no

NOTE: Fast set-up actions which shall be performed by the Mobile Stations if indicated in the SIM data are the use of the appropriate establishment cause and the reaction on accelerated establishment procedures allowed by the network (see subclause 11.6).

The automatic reaction of the Mobile Station for automatic answering or called party pre-emption shall be predefined by the user via MMI. For each subscribed priority level the user shall be able to configure the Mobile Station for automatic acceptation or indication or rejection of an incoming call.

In addition, the Mobile Station shall verify a priority level selected by the user at call establishment against the priority levels stored on the SIM and act accordingly as defined in subclause 11.5.1.2.

The Mobile Station shall perform automatically the related functions for a fast call set-up if related with a selected priority.

8.5 Stored in the GCR (GSM only)

In the network, specific service configurations for VBS and VGCS calls which are registered in the GCR, a priority level shall be assigned to each voice broadcast call or voice group call configuration, according to GSM 03.69 and GSM 03.68, respectively.

9 Identities

No specific requirements are identified.

10 Operation and maintenance aspects

NOTE: A list and short description of the operation and maintenance aspects will be given. This includes the options and parameters which can be set by the operator.

- Handling of timers;

- registration aspects etc.

11 Functions and information flow

11.1 Subscription

When the subscriber record is created in the HLR, the maximum priority level a subscriber is entitled to use shall be included.

11.2 Change of subscription

The network operator can change the maximum priority level of any eMLPP subscriber at any time. A change of subscription shall not affect any on-going calls at the moment of change. The subscriber cannot change the maximum priority level via the MMI.

11.3 Call set-up

11.3.1 Mobile originated calls

11.3.1.1 Indication of priority

The Mobile Station may indicate the priority of each call initiated. If no priority is indicated by the user or a non-compatible Mobile Station is used then the default priority level shall be applied which is stored in the VLR. The selection of priority shall be an MMI function.

Mobile stations indicate the priority of their call in the signalling that takes place during the call establishment process.

No preferential treatment will be possible during this initial random access until the point at which the priority information is received by the network (CM_SERV_REQ message). Alternatively, a resource pre-emption might already take place on basis of an establishment cause.

In GSM, Pprior to the indication of the selected priority level in the CM_SERV_REQ message, the BSC may decide on the assignment of an SDCCH or direct assignment of a TCH on the basis of the establishment cause in the CHAN_REQ message. This allows the BSC to support a fast call set-up at the earliest stage of the call establishment. The establishment cause for emergency calls or an establishment cause indicating the request for fast call set-up shall be able to trigger this function.

In UMTS, prior to the indication of the selected priority level in the CM_SERV_REQ message, the RNC shall receive the establishment cause in the RRC CONNECTION SETUP REQUEST.

11.3.1.2 Subscription checking

The Mobile Station shall verify the selected priority level against the priority levels stored in the SIM. If the selected priority is not allowed, then the priority of the call shall be modified to that of the nearest allowed priority level below the requested level.

The MSC shall request the VLR to verify if the subscriber is allowed to use the selected priority level.

11.3.1.3 Authentication and ciphering

A GSM ~~The user or the~~ network may wish to omit or postpone authentication and ciphering in order to provide for a faster call set-up.

If the network decides to omit or postpone authentication and ciphering for a call it can send a CM_SERV_ACC message in reply to the CM_SERV_REQ message.

For further study:

> *The network, however, may allow the Mobile Station to send the SETUP message immediately or to wait for the AUTH_REQ message by an indication in the system information broadcasted on the BCCH. The Mobile Station shall be able to decide on the immediate sending of a SETUP message on the basis of the information received on the BCCH and the data stored in the SIM as defined in subclause 8.4.*

> NOTE: *The postponed authentication by sending a CM_SERV_ACC message is an application of an available function. The provisional grant of the MM connection is a new function which is to be specified.*

11.3.1.4 Indication of priority to the BSC/RNC

In GSM, ~~T~~the channel assignment request to the BSC shall also include the priority level and pre-emption capability of the connection as defined in GSM 08.08. The MSC maps the eMLPP priority on these priority levels. In addition, the eMLPP priority shall be explicitly indicated to the BSC in the assignment request. The BSC shall store the priority level in order to decide on later actions, e.g. to arrange notifications to the Mobile Station according to priorities.

In UMTS, the RAB assignment request to the RNC may also include the priority level and pre-emption capability of the connection as defined in TS 25.431. The MSC maps the eMLPP priority on these priority levels. In addition, the eMLPP priority shall be explicitly indicated to the RNC in the RAB assignment request. The RNC shall store the priority level in order to decide on later actions, e.g. to arrange notifications to the Mobile Station according to priorities.

11.3.1.5 Choice of radio channel

If an appropriate radio channel is available the BSC (for GSM) or the RNC (for UMTS) shall assign it as normal. If no channels are available then the BSC (for GSM) or the RNC (for UMTS) shall perform queuing according to the priority levels. If the assignment request has a pre-emption capability indicator, pre-emption shall be performed.

In addition, the network related service configuration defines the set-up class in relation to a priority level and therefore the allowable delay of the call establishment (see 3G TS 22.067). By using this information, the MSC shall decide whether OACSU may be applied for a call or not.

11.3.1.6 Indication of priority to the Mobile Station

If the network assigns a priority level to the call different to the one requested by the user for any reasons or if the Mobile Station does not know what priority level will be applied since no priority was included in the service request, the network can inform the Mobile Station on the assigned priority level by sending a CALL_PROCEEDING message including a priority information element.

The Mobile Station shall store the priority level requested by the user, possibly overridden by the level received by the network, to perform automatic answering of calls or pre-emption of on-going calls.

11.3.2 Mobile terminated calls

11.3.2.1 Indication of priority

For a mobile terminated call, the priority level is defined in the ISUP set-up message to the VMSC. The priority and pre-emption indications used in the ISUP shall follow the definitions of the MLPP service as defined in the ITU-T recommendations Q.85 and Q.735, respectively.

11.3.2.2 Indication of priority to the BSC/RNC

The paging command message includes the requested priority.

In GSM, Tthe channel assignment request to the BSC shallmay include the priority level and pre-emption capability of the connection as defined in GSM 08.08. The MSC maps the eMLPP priority on these priority levels. In addition, the eMLPP priority shall be explicitly indicated to the BSC in the assignment request. The BSC shall store the priority level in order to decide on later actions, e.g. to arrange notifications to the Mobile Station according to priorities.

In UMTS, the RAB assignment request to the RNC may include the priority level and pre-emption capability of the connection as defined in TS 25.431. The MSC maps the eMLPP priority on these priority levels. In addition, the eMLPP priority shall be explicitly indicated to the RNC in the RAB assignment request. The RNC shall store the priority level in order to decide on later actions, e.g. to arrange notifications to the Mobile Station according to priorities.

11.3.2.3 Authentication and ciphering

The network may wish to omit or postpone authentication and ciphering in order to provide for a faster call set-up according to the priority level to be applied for the call and the network specific service configuration stored in the MSC.

If the network decides to omit or postpone authentication and ciphering for a call it, can send the SETUP message immediately after reception of the initial layer 3 message.

11.3.2.4 Termination with called subscriber in idle mode or group receive mode

In this case the Mobile Station shall be paged in the normal manner, but with the paging messages also containing the priority level of the call. In addition, the priority level will be provided with the SETUP message.

The Mobile Station in group receive mode shall consult the internal service configuration list stored on the SIM to establish whether it should automatically respond to the paging request.

The Mobile Station in idle mode does not need to analyse the priority level from the paging request message but can derive it from the SETUP message and then decide on automatic acceptance of the call.

In the case where the called subscriber is using a non compatible Mobile Station, automatic answering is not possible.

11.3.2.5 Termination with called subscriber in dedicated mode

In the case where the called subscriber has a subscription for eMLPP and for Call Waiting and is using a compatible Mobile Station, the Mobile Station shall be informed of the priority of the new call together with the call waiting indication. The Mobile Station will then consult the internal service configuration list stored on the SIM to establish whether it should automatically accept the waiting call without consulting the user, or whether the call waiting facility will be used as normal.

In the case where the called subscriber has no subscription for Call Waiting, called party pre-emption is not possible.

In the case where the called subscriber is using a non compatible Mobile Station and has a subscription for Call Waiting, Call Waiting shall be performed as normal.

11.3.3 Voice group call or voice broadcast call (GSM only)

11.3.3.1 Indication of priority to the related MSC

For each voice group call or voice broadcast call service configuration registered in the GCR as defined in GSM 03.68 and GSM 03.69, respectively, a priority level is assigned at registration of the GCR data by the service provider. The priority level will be provided by the GCR together with the call attributes.

11.3.3.2 Authentication and ciphering

Authentication of the calling service subscriber shall be performed equivalent to the standard mobile originated call case as defined in subclause 11.5.1.3. The calling service subscriber shall be treated with his selected priority or with his default priority as known in the VLR as long as he has an own link with the network (see GSM 03.68 and GSM 03.69). The priority which applies to the voice group call channel or voice broadcast call channel is defined in the GCR.

Authentication and ciphering of the calling service subscriber might therefore be performed, omitted or postponed (see subclause 11.3.1.3).

11.3.3.3 Indication of priority to the called Mobile Stations

The priority level shall be indicated together with the related paging messages or notification messages and treated in the Mobile Station as defined in GSM 03.68 and GSM 03.69, respectively.

11.4 Pre-emption

11.4.1 Choice of communication to pre-empt

For all resources where pre-emption may be required, namely radio channels, A-interface (for GSM) or Iu interface (for UMTS) channels and inter switch trunks, the network specific service configuration stored within the MSC shall be used to determine whether pre-emption should occur, and if so, which communication to pre-empt. The MSC shall inform the BSS (for GSM) or RNC (for UMTS) about priority and pre-emption by using the priority message element in the assignment request as defined in GSM 08.08 (for GSM) and TS 25.431 (for UMTS). Mapping of the priority information in this message element on the network specific eMLPP configuration shall be performed in the MSC.

11.4.2 Release procedures

Suitable messages shall be passed from the point at which the pre-emption is to occur, to other affected entities. In the case of fast call set-up, such pre-indication may need to be foregone to meet the required set-up time.

The indication to the pre-empted user shall be performed by an indication for congestion as defined in 3G TS 22.101.

11.5 Pre-emption at handover/relocation

When an on-going call is handed over or intorelocated into a fully used cell, the BSC or RNC shall perform queuing and pre-emption if necessary according to the priority and pre-emption capability information received with the assignment request.

In case of BSS external handover or RNC relocation, the priority and pre-emption capability information shall be included in the handover request as defined in GSM 08.08 (for GSM) and TS 25.431 (for UMTS).

11.6 Overview of call related signalling

In this overview, the message structure to implement the specified concept are is identified, and brief details are given of each message.

A diagrammatic representation of the transport procedures to be used to carry the priority information in case of standard point-to-point calls are given in figures 1 to 6. The message flow is not represented completely.

The corresponding message flows in case of voice group calls or voice broadcast calls are given in GSM 03.68 and GSM 03.69, respectively.

```
        MS                    BSS                   MSC
         ┌─┐                   ┌─┐                   ┌─┐
         │ │ RACH (CHAN_REQ)   │ │                   │ │
         │ ├──────────────────>│ │                   │ │
         │ │     IMM_ASS        │ │                   │ │
         │ │<──────────────────┤ │                   │ │
         │ │ SABM (SERV_REQ)    │ │  COM_L3_INFO      │ │
         │ ├──────────────────>│ ├──────────────────>│ │
         │ │  UA (SERV_REQ)     │ │                   │ │
         │ │<──────────────────┤ │                   │ │
         │ │                    │ │    AUTH_REQ       │ │
         │ │<───────────────────────────────────────┤ │
         │ │   AUTH_RES         │ │                   │ │
         │ ├───────────────────────────────────────>│ │
         │ │                    │ │  CIPH_MOD_CMD     │ │
         │ │<──────────────────┤ │<──────────────────┤ │
         │ │  CIPH_MOD_COM      │ │                   │ │
         │ ├──────────────────>│ ├──────────────────>│ │
         │ │    SETUP           │ │                   │ │
         │ ├───────────────────────────────────────>│ │
         │ │                    │ │ CALL_PROCEEDING   │ │
         │ │<───────────────────────────────────────┤ │
         │ │                    │ │   ASS_REQ         │ │
         │ │                    │ │<──────────────────┤ │
         │ │   ASS_CMD          │ │                   │ │
         │ │<──────────────────┤ │                   │ │
         │ │    SABM            │ │                   │ │
         │ ├──────────────────>│ │                   │ │
         │ │     UA             │ │                   │ │
         │ │<──────────────────┤ │                   │ │
         │ │   ASS_COM          │ │   ASS_COM         │ │
         │ ├──────────────────>│ ├──────────────────>│ │
         └─┘                   └─┘                   └─┘
```

Figure 1A: Signalling information required for the prioritisation at mobile originating call establishment without fast call set-up (for GSM)

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message.

SABM (SERV_REQ): Modified form of the current L3-MM CM SERVICE REQUEST where the priority level is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible Mobile Station the Mobile Station shall send a standard service request message and the network shall apply a default priority to their request.

UA (SERV_REQ): Standard message.

COM_L3_INFO: The MSC is provided with initial information about the requested service together with the selected priority level if applicable.

AUTH_REQ: Standard message.

AUTH_RES: Standard message.

CIPH_MOD_CMD: Standard message.

CIPH_MOD_COM: Standard message.

SETUP: Standard message.

CALL_PROCEEDING: The network may include the assigned priority level in a CALL_PROCEEDING message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested.

ASS_REQ: This message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the service request or from the VLR data. In addition, the eMLPP level is included as explicit information.

ASS_CMD: Standard message.

SABM: Standard message.

UA: Standard message.

ASS_COM: Standard message.

```
        MS                      BSS                     MSC
        ┌─┐                     ┌─┐                     ┌─┐
        │ │   [SYSTEM INFO]     │ │                     │ │
        │ │<────────────────────│ │                     │ │
        │ │   RACH (CHAN_REQ)    │ │                     │ │
        │ │────────────────────>│ │                     │ │
        │ │      IMM_ASS         │ │                     │ │
        │ │<────────────────────│ │                     │ │
        │ │  SABM (SERV_REQ)     │ │   COM_L3_INFO       │ │
        │ │────────────────────>│ │────────────────────>│ │
        │ │   UA (SERV_REQ)      │ │                     │ │
        │ │<────────────────────│ │                     │ │
        │ │       SETUP          │ │                     │ │
        │ │─────────────────────────────────────────────>│ │
        │ │                      │ │  CALL_PROCEEDING     │ │
        │ │<─────────────────────────────────────────────│ │
        │ │  CHAN_MOD_MODIFY     │ │                     │ │
        │ │<────────────────────│ │                     │ │
        │ │ CHAN_MOD_MODIFY_ACK  │ │                     │ │
        │ │────────────────────>│ │                     │ │
        └─┘                     └─┘                     └─┘
```
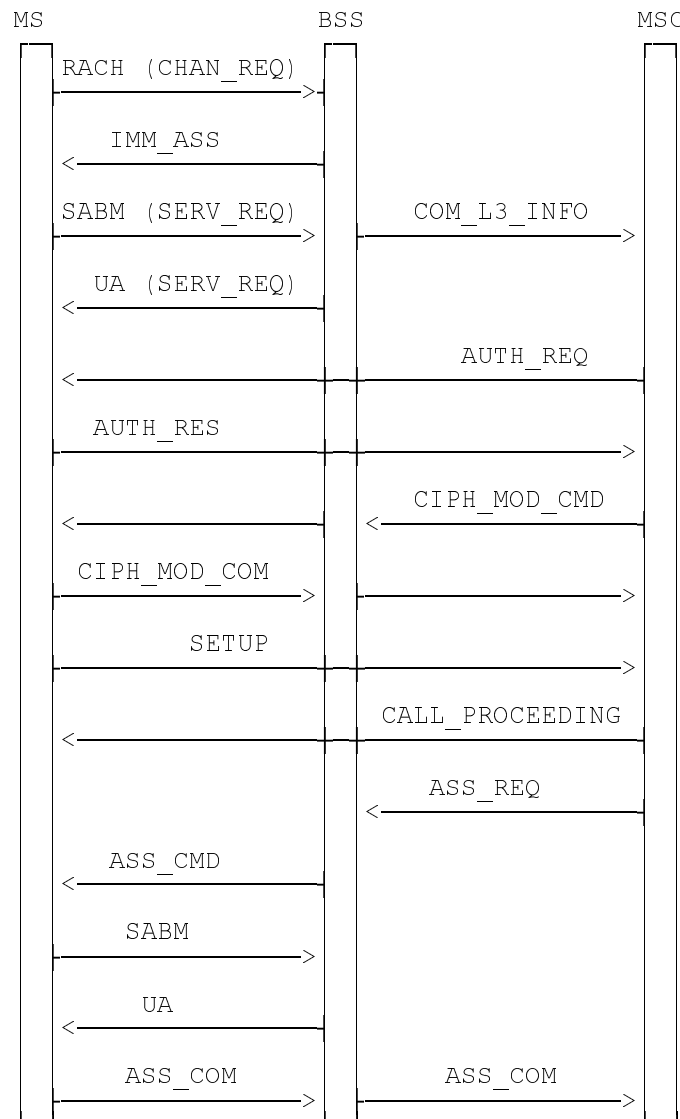
Figure 2: Signalling information required for the prioritisation at mobile originating call establishment with fast call set-up (for GSM)

For further study:

> *SYSTEM INFO: The network may provide information on the BCCH system information, that a MM connection is provisional granted after establishment of the main signalling link.*

If such information is provided on the BCCH and the user has selected a fast call set-up, the Mobile Station shall immediately send a SETUP message to the network after the main signalling link is established.

Initial RACH CHAN_REQ: Standard message.

For further study:

A new establishment cause shall be provided to indicate the requirement for the direct assignment of a TCH (very early assignment) for the support of fast call set-up procedure.

IMM_ASS: Standard message.

SABM (SERV_REQ): Modified form of the current L3-MM CM SERVICE REQUEST where the priority level is provided in addition if a priority selection is performed by the user.

UA (SERV_REQ): Standard message.

COM_L3_INFO: The MSC is provided with initial information about the requested service together with the selected priority level if applicable.

If the network itself decides not to perform ciphering, it shall send an CM_SERV_ACC message.

SETUP: Standard message.

CALL_PROCEEDING: The network may include the assigned priority level in a CALL_PROCEEDING message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the service request or from the VLR data. In addition, the eMLPP level is included as explicit information.

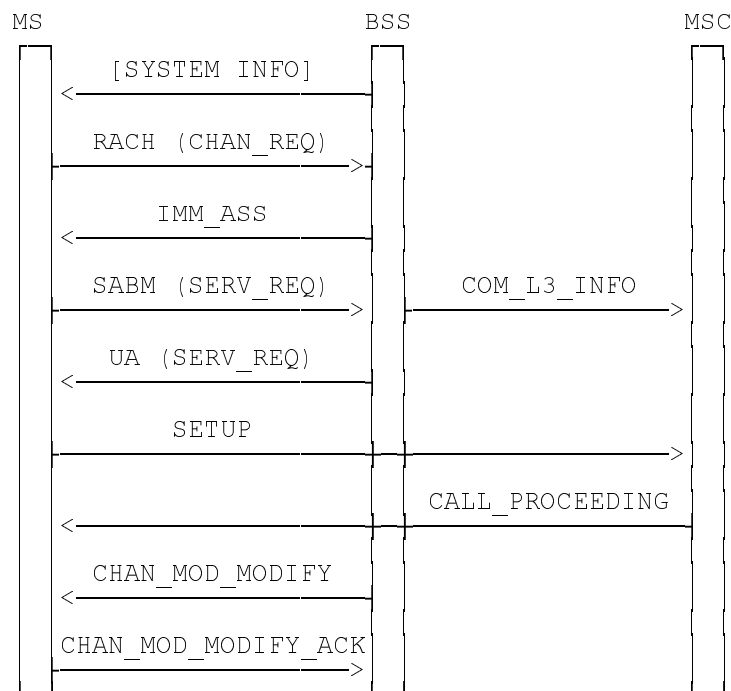**CHAN_MOD_MODIFY:** Standard message.

CHAN_MOD_MODIFY_ACK: Standard message.

Figure 3: Signalling information required for the prioritisation at mobile terminating call establishment without fast call set-up and without called-party pre-emption (for GSM)

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

PAGING: Modified paging command including the priority level to be applied.

PAG_REQ: Modified paging message including the related priority level.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message.

SABM (PAG_RSP): Standard message.

UA (PAG_RSP): Standard message.

PAG_RSP: Standard message.

AUTH_REQ: Standard message.

AUTH_RES: Standard message.

CIPH_MOD_CMD: Standard message.

CIPH_MOD_COM: Standard message.

SETUP: Standard message.

CALL_CONF: Standard message.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from the incoming set-up message. In addition, the eMLPP level is included as explicit information.

ASS_CMD: Standard message.

SABM: Standard message.

UA: Standard message.

ASS_COM: Standard message.

Figure 4: Signalling information required for the prioritisation at mobile terminating call establishment with fast call set-up and without called-party pre-emption

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

PAGING: Modified paging command including the priority level to be applied.

PAG_REQ: Modified paging message including the related priority level.

Initial RACH CHAN_REQ: Standard message. A new establishment cause shall be provided to indicate the requirement for the direct assignment of a TCH (very early assignment) for the support of fast call set-up procedure.

IMM_ASS: Standard message.

SABM (PAG_RSP): Standard message.

UA (PAG_RSP): Standard message.

PAG_RSP: Standard message.

For fast call set-up the network shall immediately send a SETUP message to the Mobile Station. Authentication and ciphering may not be performed or delayed by the network.]

SETUP: Modified message with an indication of the priority level.

CALL_CONF: Standard message.

ASS_REQ: This standard message is sent from the MSC to the BSC including the call priority and pre-emption capability to be applied as defined in GSM 08.08, according to the priority information the MSC has obtained from incoming set-up message. In addition, the eMLPP level is included as explicit information.

CHAN_MOD_MODIFY: Standard message.
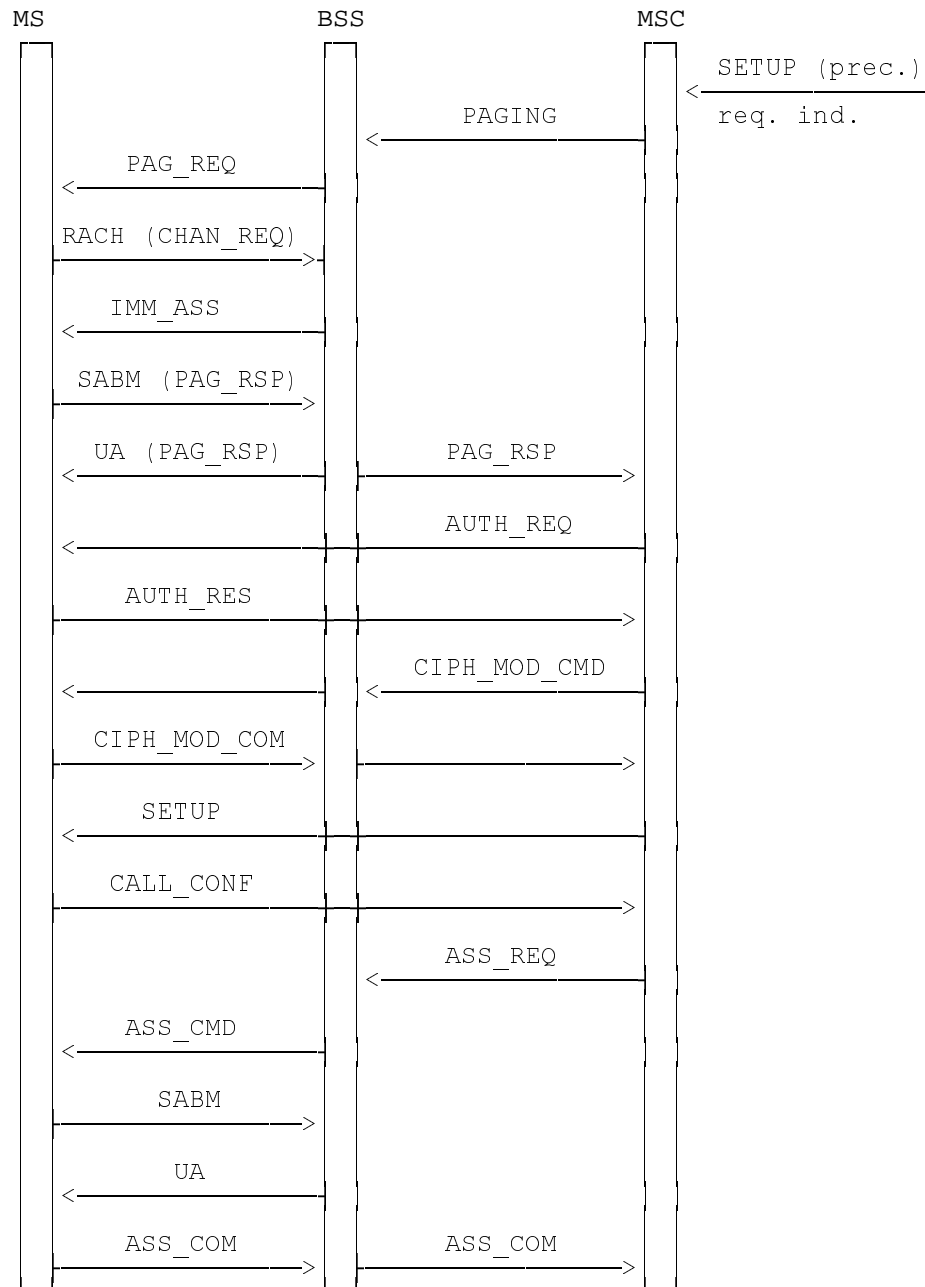
CHAN_MOD_MODIFY_ACK: Standard message.

Figure 5: Signalling information required for the called-party pre-emption in case of an existing telephony call and subscription for HOLD

Call Waiting should always be subscribed together with eMLPP. If not, no called party pre-emption is possible for point-to-point calls.

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

SETUP: Modified SETUP message with an indication of the priority level.

CALL_CONF: Standard message with cause user busy.

On reception of the SETUP message a compatible Mobile Station decides on called party pre-emption. If called party pre-emption applies, the Mobile Station shall automatically accept the waiting call and put the other call on hold.

A non compatible Mobile Station shall not be harmed by the priority information and shall perform Call Waiting functions as normal.

ALERT: Standard message. ALERTING may be omitted in case of called party pre-emption.

HOLD: Standard message.

HOLD_ACK: Standard message.

CONNECT: Standard message.

CONN_ACK: Standard message.

> NOTE: In case of an incoming data call a mode modify procedure has to be performed which is not included in figure 5.

```
              MS                    BSS                   MSC
               ┌──┐                  ┌──┐                  ┌──┐
               │  │                  │  │                  │  │        SETUP (prec.)
               │  │                  │  │                  │  │ <───────────────────
               │  │                  │  │                  │  │        req. ind.
               │  │                  │  │      SETUP       │  │
               │  │ <──────────────────────────────────── │  │
               │  │     CALL_CONF    │  │                  │  │
               │  │ ───────────────────────────────────>  │  │
               │  │      ALERT       │  │                  │  │
               │  │ ───────────────────────────────────>  │  │
               │  │    RELEASE_COM   │  │                  │  │
               │  │ ───────────────────────────────────>  │  │
               │  │     CONNECT      │  │                  │  │
               │  │ ───────────────────────────────────>  │  │
               │  │                  │  │     CONN_ACK     │  │
               │  │ <──────────────────────────────────── │  │
               └──┘                  └──┘                  └──┘
```
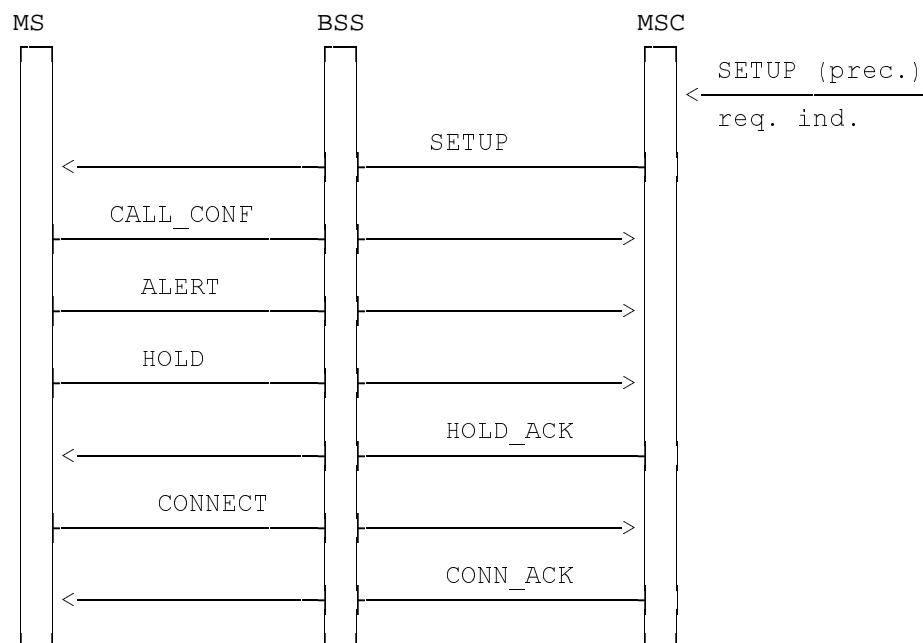
Figure 6: Signalling information required for the called-party pre-emption in case of point-to-point data calls or no subscription for HOLD

Call Waiting should always be subscribed together with eMLPP. If not, no called party pre-emption is possible for point-to-point calls.

SETUP (prec.) req. ind.: In addition to the basic call requirements, the contents of the set-up information flow shall contain the information on the requested MLPP priority level.

SETUP: Modified SETUP message with an indication of the priority level.

CALL_CONF: Standard message with cause user busy.

On reception of the SETUP message a compatible Mobile Station decides on called party pre-emption. If called party pre-emption applies, the Mobile Station shall automatically accept the waiting call and clear the existing data call.

A non compatible Mobile Station shall not be harmed by the priority information and shall perform Call Waiting functions as normal.

ALERT: Standard message. ALERTING may be omitted in case of called party pre-emption.

RELEASE_COM: Standard message which shall be send immediately after the ALERT with a new cause for called party pre-emption.

CONNECT: Standard message.

CONN_ACK: Standard message.

11.7 Overview of call independent signalling

11.7.1 Registration

At the beginning of registration subscription, provision of the supplementary service and sufficiency of registration information has to be checked.

The default priority level has to be registered in the network.

When the mobile subscriber registers eMLPP, the network shall attempt to register the service. The network will return notification of acceptance of the request. This notification will include the default priority level.

If the system cannot accept a registration request, the network sends a notification that eMLPP registration was not successful to the served mobile subscriber.

The information flow for registration of eMLPP is shown in figure 7.

```
      MS                MSC               VLR               HLR
       |                 |                 |                 |
       |  Register eMLPP |                 |                 |
       |---------------->|                 |                 |
       |                 | Register eMLPP  |                 |
       |                 |---------------->|                 |
       |                 |                 | Register eMLPP  |
       |                 |                 |---------------->|
       |                 |                 |   Acknowledge   |
       |                 |                 |<----------------|
       |                 |   Acknowledge   |                 |
       |                 |<----------------|                 |
       | Release complete|                 |                 |
       |<----------------|                 |                 |
```
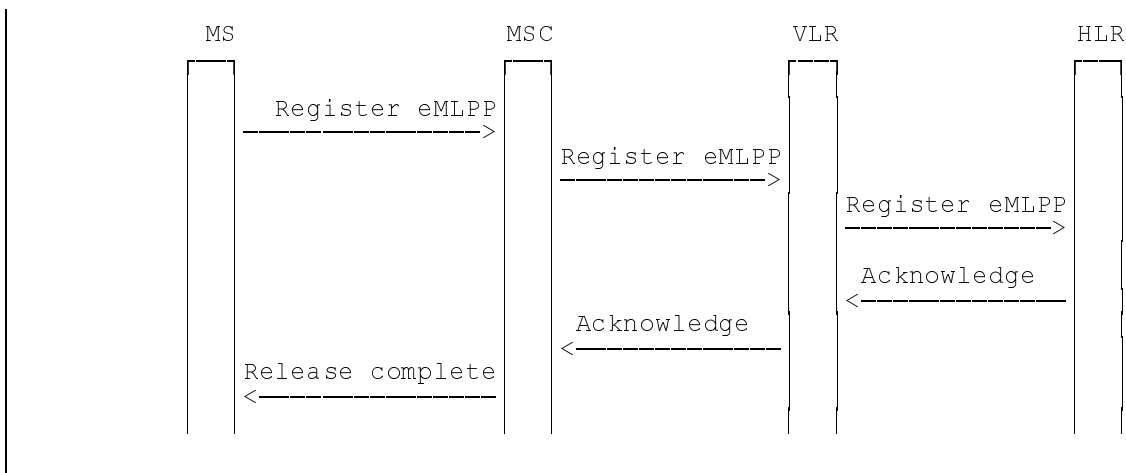
Figure 7: Registration of eMLPP

11.7.2 Interrogation

The mobile subscriber can request the status of the supplementary service, the maximum and default priority levels and be informed if the service is provided to him/her and on the actual maximum and default priority levels. This procedure is illustrated in figure 8.

```
      MS                MSC               VLR               HLR
       |                 |                 |                 |
       | Interrogate eMLPP|                |                 |
       |---------------->|                 |                 |
       |                 | Interrogate eMLPP                 |
       |                 |---------------->|                 |
       |                 |   Acknowledge   |                 |
       |                 |<----------------|                 |
       | Release Complete|                 |                 |
       |<----------------|                 |                 |
```
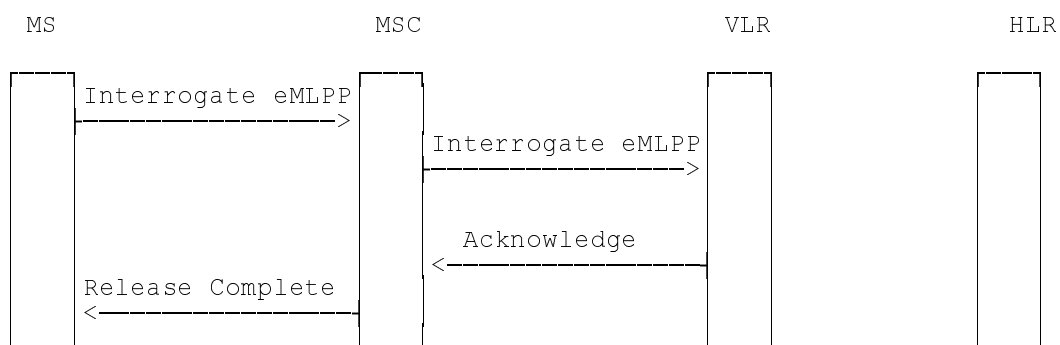
Figure 8: Interrogation of eMLPP

Annex A (informative): Change history

Document history		
V3.0.0	May 1999	Approved at TSGN #3. Under TSG TSG CN Change Control.
V3.1.0	March 2000	Approved at TSGN#07. Change of references from GSM to TR and TS.

Change history						
TSG CN#	**Spec**	**Version**	**CR**	**<Phase>**	**New Version**	**Subject/Comment**
Apr 1999	GSM 03.67	6.0.0				Transferred to 3GPP CN1
CN#03	23.067				3.0.0	Approved at CN#03
CN#07	23.067	3.0.0	001	R99	3.1.0	Cause pre-emption removed from HOLD message

3GPP TSG-CN4
CN#05 Meeting , Paris, FRANCE
13th November – 17th November 2000

Document **N4-001086**

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

24.067 CR 001r1   Current Version: **3.0.0**

For submission to: CN#10   for approval   **X**   strategic

for information   non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM   ME **X**   UTRAN / Radio   Core Network **X**
(at least one should be marked with an X)

Source: CN4   **Date:**   2000-11-17

Subject: CR 24.067 on eMLPP correction for GSM/UMTS use

Work item: ASCI

Category: F Correction   **X**   **Release:**   Phase 2
    A Corresponds to a correction in an earlier release   Release 96
    B Addition of feature   Release 97
    C Functional modification of feature   Release 98
    D Editorial modification   Release 99   **X**
            Release 00

Reason for change: A CR which is supported by consensus in the CN4 meeting.

The aim of this CR is to update TS 24.067 for GSM/UMTS use. To be prepared for GSM/UMTS use, correction of the references and addition of UMTS parts have been done.

Clauses affected:

Other specs affected: Other 3G core specifications   → List of CRs:
    Other GSM core specifications   → List of CRs:
    MS test specifications   → List of CRs:
    BSS test specifications   → List of CRs:
    O&M specifications   → List of CRs:

Other comments:

1 Scope

The present document specifies the procedures used at the radio interface (Reference point Um for GSM and Reference point Uu for UMTS as defined in TS 24.002GSM 04.02) for normal operation, invocation, registration and interrogation of the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) supplementary service. Provision and withdrawal of supplementary services is an administrative matter between the mobile subscriber and the service provider and cause no signalling on the radio interface.

In TS 24.010GSM 04.10 the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

TS 24.080GSM 04.80 specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in TS 22.004GSM 02.04 and TS 22.08xGSM 02.8x and 22.09x02.9x-series. TS 22.067GSM 02.67 is related specially to eMLPP.

Technical realisation of supplementary services is described in TS 23.011GSM 03.11 and TS 23.08xGSM 03.8x and 23.09x03.9x-series.

TS23.067GSM 03.67 is related specially to eMLPP.

The procedures for Call Control, Mobility Management and Radio Resource management at the layer 3 radio interface are defined in TS 24.007GSM 04.07 and TS 24.008GSM 04.08.

The procedure for Radio Resource management at layer 3 radio interface is defined in GSM 04.18 (for GSM) and TS 25.331 (for UMTS).

2 References

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

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

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

- For a non-specific reference, the latest version applies.

- 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]   TS 22.004GSM 02.04: "Digital cellular telecommunications system (Phase 2+); General on supplementary services".

[3]   TS 22.067GSM 02.67: "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1".

[4]   TS 22.081GSM 02.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 1".

[5]   TS 22.082GSM 02.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 1".

[6]   TS 22.083GSM 02.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[7] TS 22.084GSM 02.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 1".

[8] TS 22.085GSM 02.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 1".

[9] TS 22.086GSM 02.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) Supplementary Services - Stage 1".

[10] TS 22.088GSM 02.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 1".

[11] TS 22.090GSM 02.90: "Digital cellular telecommunications system (Phase 2+); Stage 1 description of Unstructured Supplementary Service Data (USSD)".

[12] TS 22.092GSM 02.91: "Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT)".

[13] TS 22.011GSM 03.11: "Digital cellular telecommunications system (Phase 2+); Technical realization of supplementary services".

[14] TS 23.067GSM 03.67: "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 2".

[15] GSM 03.68: "Digital cellular telecommunications system (Phase 2+);Voice Group Call Service (VGCS) - Stage 2".

[16] GSM 03.69: "Digital cellular telecommunications system (Phase 2+);Voice Broadcast Service (VBS) - Stage 2".

[17] TS 23.081GSM 03.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 2".

[18] TS 23.082GSM 03.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 2".

[19] TS 23.083GSM 03.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".

[20] TS 23.084GSM 03.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 2".

[21] TS 23.085GSM 03.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 2".

[22] TS23.089GSM 03.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 2".

[23] TS 23.088GSM 03.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 2".

[24] TS 23.090GSM 03.90: "Digital cellular telecommunications system (Phase 2+); Unstructured supplementary services operation - Stage 2".

[25] TS 23.091GSM 03.91: "Digital cellular telecommunications system (Phase 2+); Explicit Call Transfer (ECT) supplementary service - Stage 2".

[26] TS 24.002GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM – UMTS Public Land Mobile Network (PLMN) access reference configuration".

[27] TS 24.007GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".

[28] TS 24.008GSM 04.08: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification; Core Network protocols – Stage 3".

[29]   TS 24.010~~GSM 04.10~~: "~~Digital cellular telecommunications system (Phase 2+);~~ Mobile radio interface layer 3 Supplementary services specification; General aspects".

[30]   TS 24.080~~GSM 04.80~~: "~~Digital cellular telecommunications system (Phase 2+);~~ Mobile radio interface layer 3 supplementary services specification Formats and coding".

[31]   TS 21.905: "3G Vocabulary"

[32]   TS 25.331: " Mobile radio interface layer 3 specification; RRC Protocol Specification"

[33]   GSM 04.18: " Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification; Radio Resource Control Protocol "

3   Definitions and abbreviations

3.1   Definitions

Definitions used in the present document are defined in TS 22.067~~GSM 02.67~~ and TS 23.067~~GSM 03.67~~.

3.2   Abbreviations

Abbreviations used in the present document are listed in GSM 01.04 and TS 21.905.

For the purposes of the present document, the following abbreviations apply:

eMLPP   enhanced MLPP
MLPP   Multi-Level Precedence and Pre-emption
VBS   Voice Broadcast Service
VGCS   Voice Group Call Service

4   enhanced Multi-Level Precedence and Pre-emption (eMLPP)

4.1   Normal operation

NOTE: In the call related messages only the additional information for the eMLPP supplementary service is shown in the figures.

4.1.1   Mobile originated calls

The mobile station can indicate the priority of each call initiated. If no priority is indicated by the user or a non-compatible mobile station is used then the default priority level shall be applied which is stored in the VLR. The selection of priority shall be an MMI function.

For mobile originated calls in GSM mode, the corresponding message flows are shown in figure 1.1.

```
    MS                                                                          Network

                                IMM_ASS
        <----------------------------------------------------------------------------------------------

                    SABM (CM_SERV_REQ (PriorityLevel))
        ---------------------------------------------------------------------------------------------->

                    UA (CM_SERV_REQ (PriorityLevel))
        <----------------------------------------------------------------------------------------------

                                AUTH_REQ
        <----------------------------------------------------------------------------------------------

                                AUTH_RES
        ---------------------------------------------------------------------------------------------->

                              CIPH_MOD_CMD
        <----------------------------------------------------------------------------------------------

                              CIPH_MOD_COM
        ---------------------------------------------------------------------------------------------->

                                  SETUP
        ---------------------------------------------------------------------------------------------->

                       CALL_PROCEEDING (PriorityLevel)
        <----------------------------------------------------------------------------------------------
```

Figure 1.1: Signalling information required for the prioritisation at mobile originating call establishment (in GSM mode)

IMM_ASS: Standard GSM Radio resource management message which is sent if no RR connection was already established.

SABM (CM_SERV_REQ (PriorityLevel)): L3-MM CM SERVICE REQUEST where the priority level information element is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible mobile station the mobile station shall send a service request message without priority level information element and the network shall apply a default priority to the request. The message may be piggybacked in a SABM if no RR connection was already established.

UA (CM_SERV_REQ (PriorityLevel): Standard message to acknowledge the layer 2 link which is sent if no RR connection was already established. The priority level is the same as received by the network.

AUTH_REQ: Standard message which is sent if the network applies authentication as shown in figure 1.1. If not, the network will sent a standard CM_SERVICE_ACCEPT message.

AUTH_RES: Standard message which is sent if the network applies authentication.

CIPH_MOD_CMD: Standard message which is sent if the network applies ciphering as shown in figure 1.1.

CIPH_MOD_COM: Standard message which is sent if the network applies ciphering.

SETUP: Standard message.

CALL_PROCEEDING: The network shall include the assigned priority level in a CALL_PROCEEDING message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested.

For mobile originated calls in UMTS mode, the corresponding message flows are shown in figure 1.2.

```
MS                                                                                    Network

                        RRC CONNECTION SETUP COMPLETE
        ------------------------------------------------------------------------------------->

                            CM_SERV_REQ (PriorityLevel))
        ------------------------------------------------------------------------------------->

                                    AUTH_REQ
        <-------------------------------------------------------------------------------------

                                    AUTH_RES
        ------------------------------------------------------------------------------------->

                                 CIPH_MOD_CMD
        <-------------------------------------------------------------------------------------

                                 CIPH_MOD_COM
        ------------------------------------------------------------------------------------->

                                    SETUP
        ------------------------------------------------------------------------------------->

                           CALL_PROCEEDING (PriorityLevel)
        <-------------------------------------------------------------------------------------
```
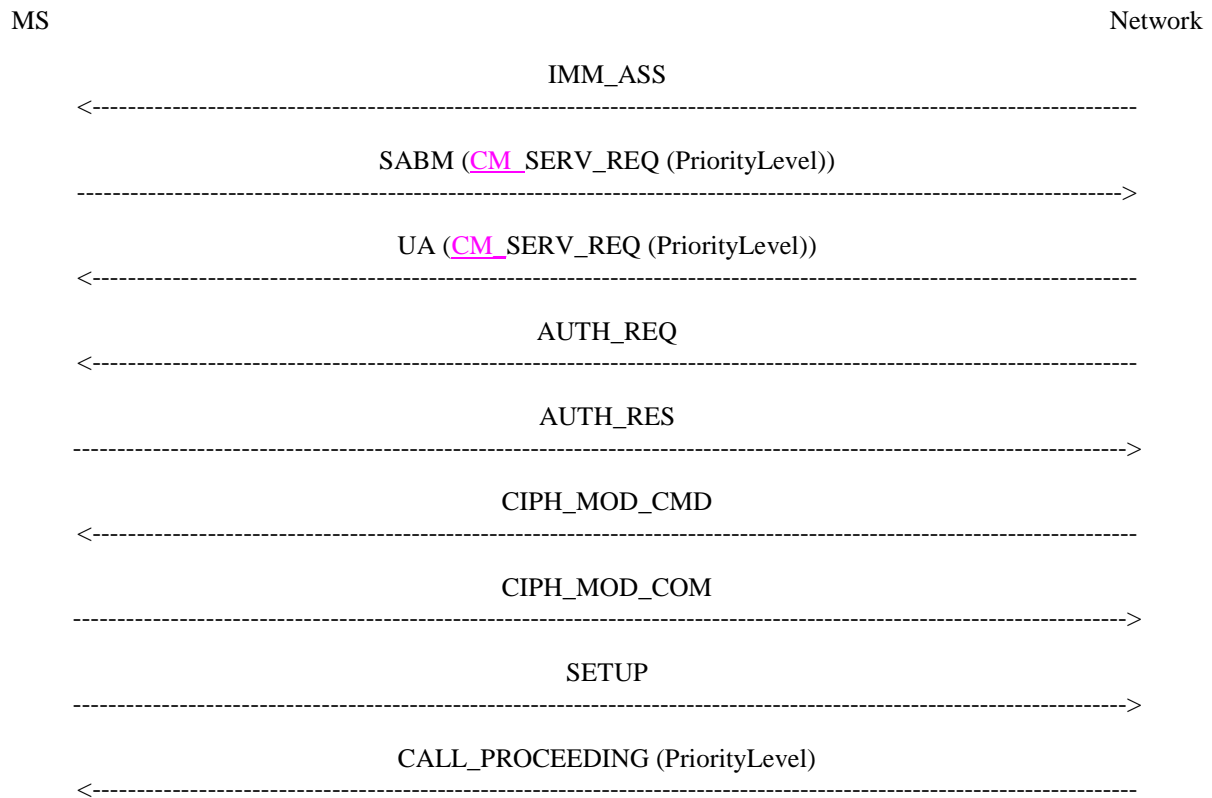
Figure 1.2: Signalling information required for the prioritisation at mobile originating call establishment (in UMTS mode)

RRC CONNECTION SETUP COMPLETE: Standard UMTS Radio resource management message which is sent to confirm the establishment of the RRC Connection by the UE.

CM_SERV_REQ (PriorityLevel): L3-MM CM SERVICE REQUEST where the priority level information element is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible mobile station the mobile station shall send a service request message without priority level information element and the network shall apply a default priority to the request.

AUTH_REQ: Standard message.

AUTH_RES: Standard message.

CIPH_MOD_CMD: Standard message.

CIPH_MOD_COM: Standard message.

SETUP: Standard message.

CALL_PROCEEDING: The network shall include the assigned priority level in a CALL_PROCEEDING message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested.

4.1.2   Mobile terminated calls

For a mobile terminated call the priority level is indicated by the calling subscriber if MLPP is used. The mobile station mayshall be paged in the normal manner, but with the paging messages also containing the priority level of the call. In addition, the priority level shall be included in the set-up message.

NOTE: Mobile stations in idle mode which are going to respond to a paging message do not need to analyse the priority level in the paging request message but can take the priority level provided in the set-up message. In GSM, Mmobile stations in group receive mode or an MS in class-B mode that communicates on GPRS radio channels when a

dedicated channel is needed ~~[or with active GPRS modes or other future services ongoing]~~ need to analyse the priority level in the paging request message in order to decide to respond to the paging request. (see TS 23.060 sub~~clause~~section 'GPRS and Dedicated Mode Priority Handling'~~16.2.2~~)
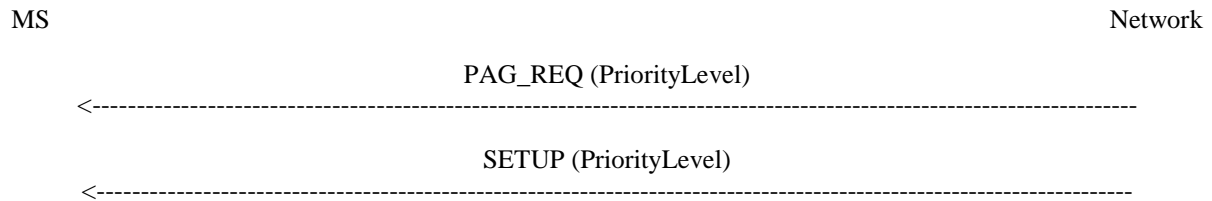
```
        MS                                                                              Network

                                    PAG_REQ (PriorityLevel)
        <----------------------------------------------------------------------------------------------------

                                    SETUP (PriorityLevel)
        <----------------------------------------------------------------------------------------------------
```

Figure 2: Signalling information required for the prioritisation at mobile terminating call establishment without called-party pre-emption.

PAG_REQ: Paging message including the related priority level to be applied. (GSM only)

SETUP: Modified SETUP message with an indication of the priority level.

4.1.3 Called party pre-emption for mobile terminated calls

In the case where the called subscriber has a subscription for eMLPP and for CW, the mobile station shall be informed of the priority of the new call together with the CW indication. On reception of the set-up message the compatible mobile station decides on called party pre-emption. If called party pre-emption applies, the mobile station shall automatically accept the waiting call and send a hold message to the network. If a hold acknowledge is received, the waiting call is accepted. If a hold reject is received for any reason, e.g. there is no subscription for hold, the other call shall be released and the waiting call accepted. If the ongoing call is not a TS11 call, the mobile station should not send a hold message to the network but release the call and accept the waiting call.

If no pre-emption applies or the called party is using a non compatible mobile station, CW will be used as normal.

```
        MS                                                                              Network

                                    SETUP (PriorityLevel)
        <----------------------------------------------------------------------------------------------------
```
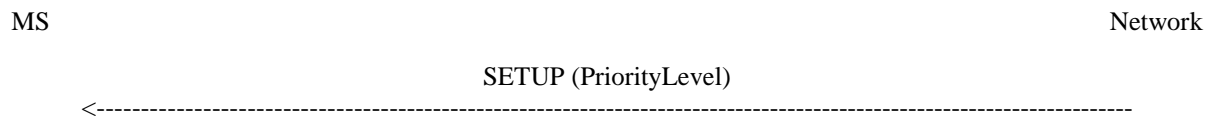
Figure 3: Signalling information required for the called-party pre-emption in case of use of a compatible mobile station

SETUP: Modified SETUP message with an indication of the priority level.

4.1.4 Group call or broadcast call, calling mobile station (GSM only)

Within each set of voice group call or voice broadcast call attributes stored in the GCR as defined in GSM 03.68 and GSM 03.69, respectively, a priority level is included if eMLPP is applied. The priority level will be provided by the GCR to the MSC together with the call attributes.

For VGCS or VBS establishment, the calling mobile station may indicate a priority level in the service request as in subclause 4.1.1. This priority level can be applied for the dedicated link of the calling mobile station as long as no different priority level in provided by the GCR. If this happens, the priority level provided by the GCR shall also be applied to the dedicated link of the calling mobile station.

MS   Network

IMM_ASS
<--

SABM (SERV_REQ (PriorityLevel))
-->

UA (SERV_REQ (PriorityLevel))
<--

AUTH_REQ
<--

AUTH_RES
-->

CIPH_MOD_CMD
<--

CIPH_MOD_COM
-->

SETUP
-->

CONNECT (GroupCallReference (PriorityLevel))
<--

Figure 4: Signalling information between the network and the calling mobile station required for the prioritisation in case of a VGCS or VBS call

IMM_ASS: Standard message which is sent if no RR connection was already established.

SABM (SERV_REQ (PriorityLevel)): L3-MM CM SERVICE REQUEST where the priority level information element is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible mobile station the mobile station shall send a service request message without priority level information element and the network shall apply a default priority to the request. The message may be piggybacked in a SABM if no RR connection was already established.

UA (SERV_REQ (PriorityLevel)): Standard message to acknowledge the layer 2 link which is sent if no RR connection was already established. The priority level is the same as received by the network.

AUTH_REQ: Standard message which is sent if the network applies authentication as shown in figure 4. If not, the network will sent a standard CM_SERVICE_ACCEPT message.

AUTH_RES: Standard message which is sent if the network applies authentication.

CIPH_MOD_CMD: Standard message which is sent if the network applies ciphering as shown in figure 4.

CIPH_MOD_COM: Standard message which is sent if the network applies ciphering.

SETUP: Standard message.

CONNECT: Information to the mobile station that the VGCS or VBS call is established with the related group or broadcast call reference as the connected number. The group or broadcast call reference includes the priority level applied for the group or broadcast call in the network. This priority level can be different to the one indicated in the CM_SERVICE_REQUEST.

4.1.5 Group or broadcast call, called mobile stations (GSM only)

Within each set of voice group call or voice broadcast call attributes stored in the GCR as defined in GSM 03.68 and GSM 03.69, respectively, a priority level is included if eMLPP is applied. The priority level will be provided by the GCR to the MSC together with the call attributes.

The priority level shall be indicated together with the related notification messages and treated in the mobile station as defined in GSM 03.68 and GSM 03.69, respectively.

MS   Network

NOTIFICATION (GroupCallReference (PriorityLevel))
<--
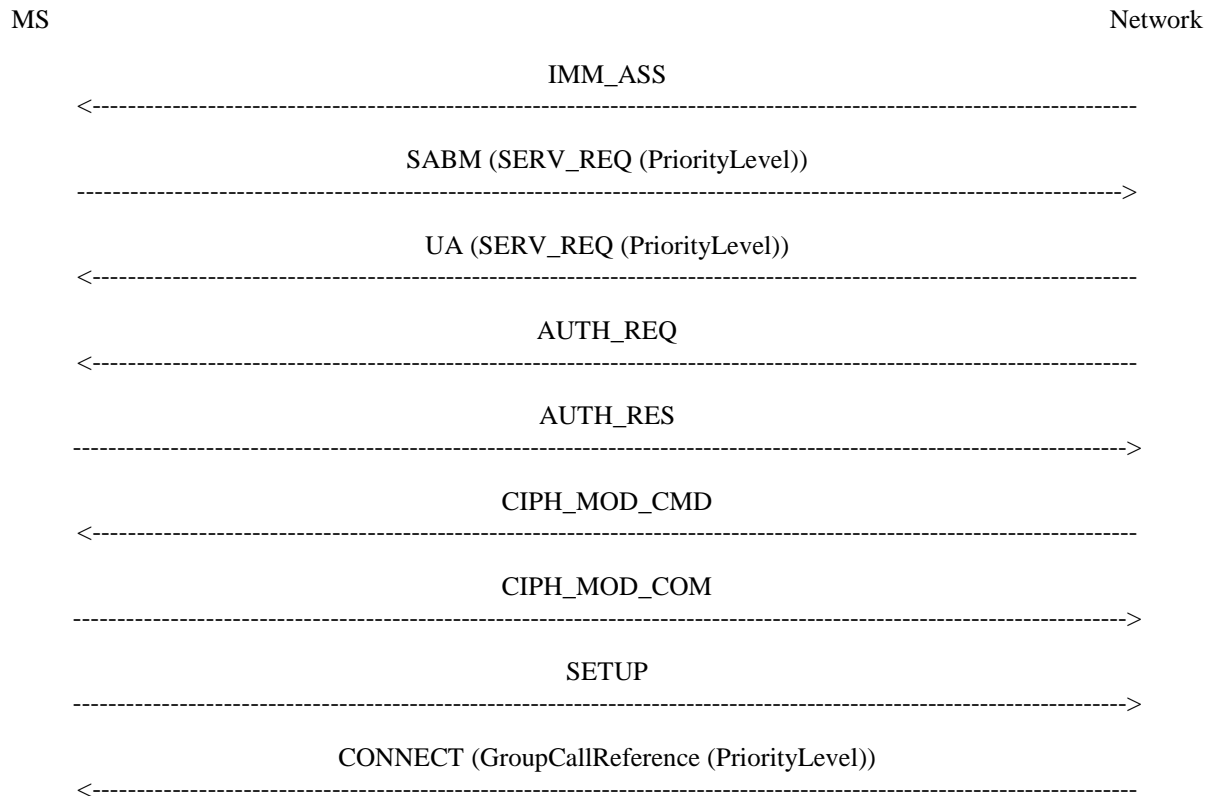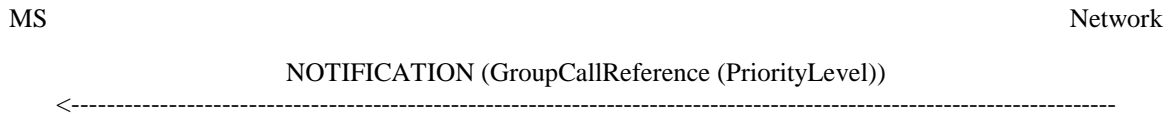
Figure 5: Signalling information between the network and the called mobile stations required for the prioritisation in case of a VGCS or VBS call

NOTIFICATION: L3 RR message NOTIFICATION/NCH_TYPE1 or NOTIFICATION/NCH_TYPE2 or NOTIFICATION/FACCH or NOTIFICATION/SACCH containing a group call reference or broadcast call reference of a notified voice group or broadcast call which includes a related priority level for that call.

4.2 Registration

The default eMLPP priority level has to be registered in the network:

An eMLPP registration request from a mobile user shall include the SS-Code of the eMLPP service and the default priority level.

If the registration is successful, the default eMLPP priority level will be registered. The network will then send a return result indicating acceptance of the request, including the default eMLPP priority level.

If the system cannot accept a registration request, a corresponding error indication is returned to the served mobile subscriber that eMLPP registration was not successful. Error values are specified in GSM 04.80.

MS   Network

REGISTER
-->
Facility (Invoke = RegisterSS (eMLPP, DefaultPriorityLevel))

RELEASE COMPLETE
<--
Facility (Return result = RegisterSS (DefaultPriorityLevel))

RELEASE COMPLETE
<- -
Facility (Return error (Error))

RELEASE COMPLETE
<- -
Facility (Reject (Invoke_problem))
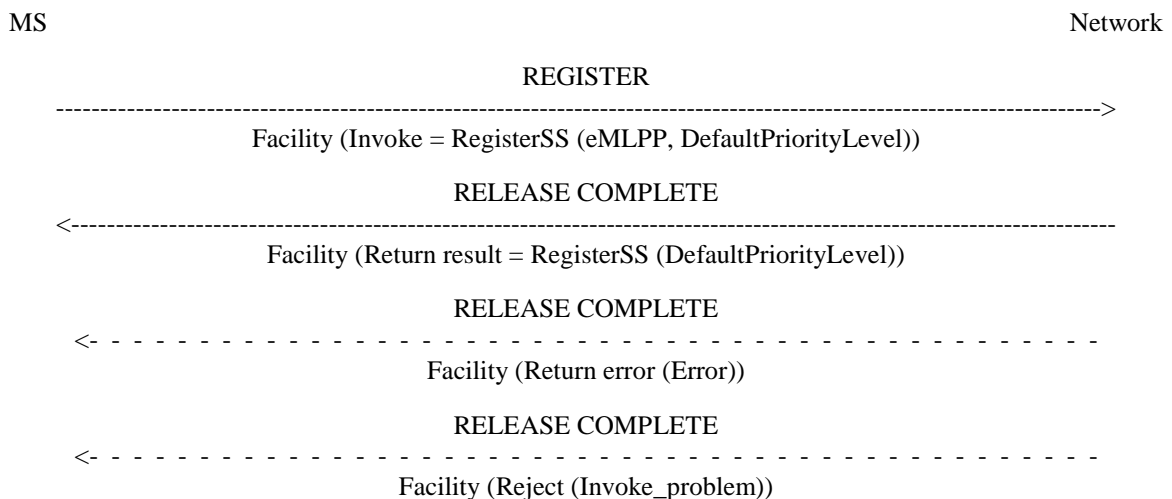
Figure 6: Registration default priority level

4.3 Erasure

A previous registration can be erased in one of two ways:

- the subscriber can register information for eMLPP for a new default priority level, thus causing the previous registration of eMLPP to be overridden;

- all information is erased as a result of withdrawal of the supplementary service (administrative handling).

4.4 Activation, deactivation

Activation and deactivation of the supplementary service enhanced Multi-Level Precedence and Pre-emption are not applicable.

4.5 Interrogation

The interrogation procedure enables the mobile subscriber to obtain information about data stored in the PLMN. The eMLPP service subscriber may interrogate the maximum priority level he can use and the actual default priority level.

If the service is provisioned, the network shall sent a return result including the SS-Status parameter and the maximum priority level which the service subscriber is allowed to use and the actual default priority level.

If the service is not provisioned, the network shall send a return result including the SS-Status parameter.

MS   Network

REGISTER

-->

Facility (Invoke = InterrogateSS (eMLPP))

RELEASE COMPLETE

<---

Facility (Return result = InterrogateSS
(SS-Status, MaximumPriorityLevel, DefaultPriorityLevel))

RELEASE COMPLETE

<- -

Facility (Return error (Error))

RELEASE COMPLETE

<- -

Facility (Reject (Invoke_problem))

Figure 7: Interrogation of the maximum and default priority levels

Annex A:
Change history

<table>
<tr><td colspan="7" align="center">**Change history**</td></tr>
<tr><td>**TSG CN#**</td><td>**Spec**</td><td>**Version**</td><td>**CR**</td><td>**<Phase>**</td><td>**New Version**</td><td>**Subject/Comment**</td></tr>
<tr><td>Apr 1999</td><td>GSM 04.67</td><td>6.0.0</td><td></td><td></td><td></td><td>Transferred to 3GPP CN1</td></tr>
<tr><td>CN#03</td><td>24.067</td><td></td><td></td><td></td><td>3.0.0</td><td>Approved at CN#03</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
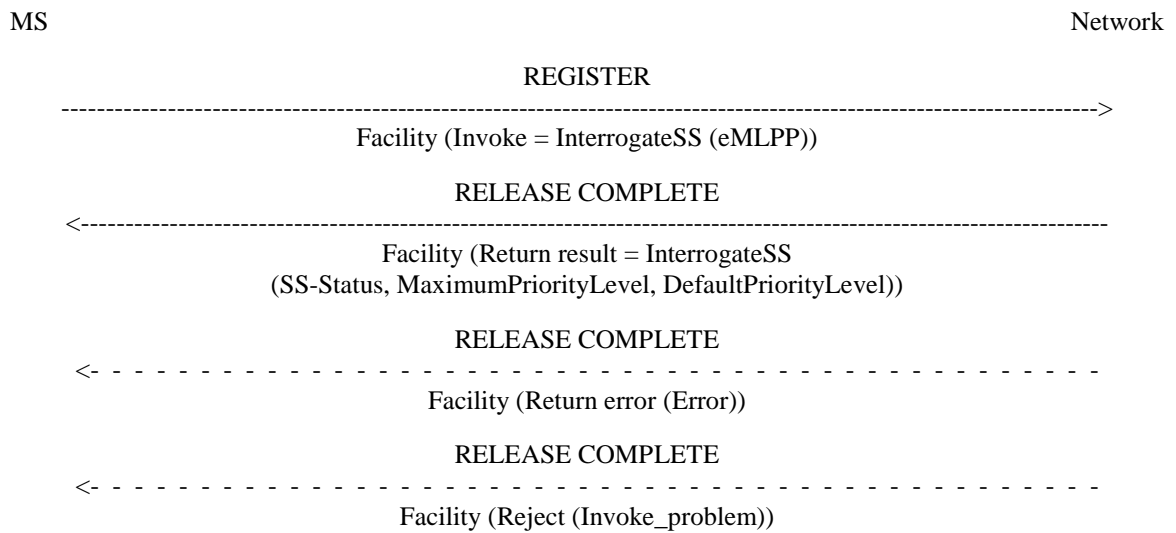<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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History

Document history		
V3.0.0	May 1999	Approved at TSGN #3. Under TSG TSG CN Change Control.

3GPP TSG-CN4
CN#05 Meeting , Paris, FRANCE
13th November – 17th November 2000

Document **N4-001118**
Revision of N4-001115,
N4-001112, N4-001087

CHANGE REQUEST

24.067	CR	**002r3**	Current Version:	3.0.0

For submission to:	CN#10	for approval	X	strategic	
		for information		non-strategic	

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network **X**
(at least one should be marked with an X)

Source:	CN4		**Date:**	15/11/2000

Subject:	The accepted priority in the CALL PROCEEDING message for GSM and UMTS

Work item:	ASCI / eMLPP

Category:

					Release:		
	F	Correction		**X**		Phase 2	
	A	Corresponds to a correction in an earlier release				Release 96	
	B	Addition of feature				Release 97	
	C	Functional modification of feature				Release 98	
	D	Editorial modification				Release 99	**X**
						Release 00	

Reason for change:

CR supported by consensus in the meeting:
- The purpose is to include priority in the CALL PROCEEDING message if the network is supporting eMLPP for GSM and UMTS.
- Correction of names of messages

Clauses affected:

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:	
Other GSM core specifications	☐	→ List of CRs:	**N4-001111 23.067-002r2**
MS test specifications	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments: This change request takes also in account the handling for UMTS (a UMTS specific part is added) and is therefor linked to the change request **N4-001094 24.067-001r1** who deals with this point.

4 enhanced Multi-Level Precedence and Pre-emption (eMLPP)

4.1 Normal operation

NOTE: In the call related messages only the additional information for the eMLPP supplementary service is shown in the figures.

4.1.1 Mobile originated calls

The mobile station can indicate the priority of each call initiated. If no priority is indicated by the user or a non-compatible mobile station is used then the default priority level shall be applied which is stored in the VLR. The selection of priority shall be an MMI function.

For mobile originated calls in GSM mode, the corresponding message flows are shown in figure 1.1.
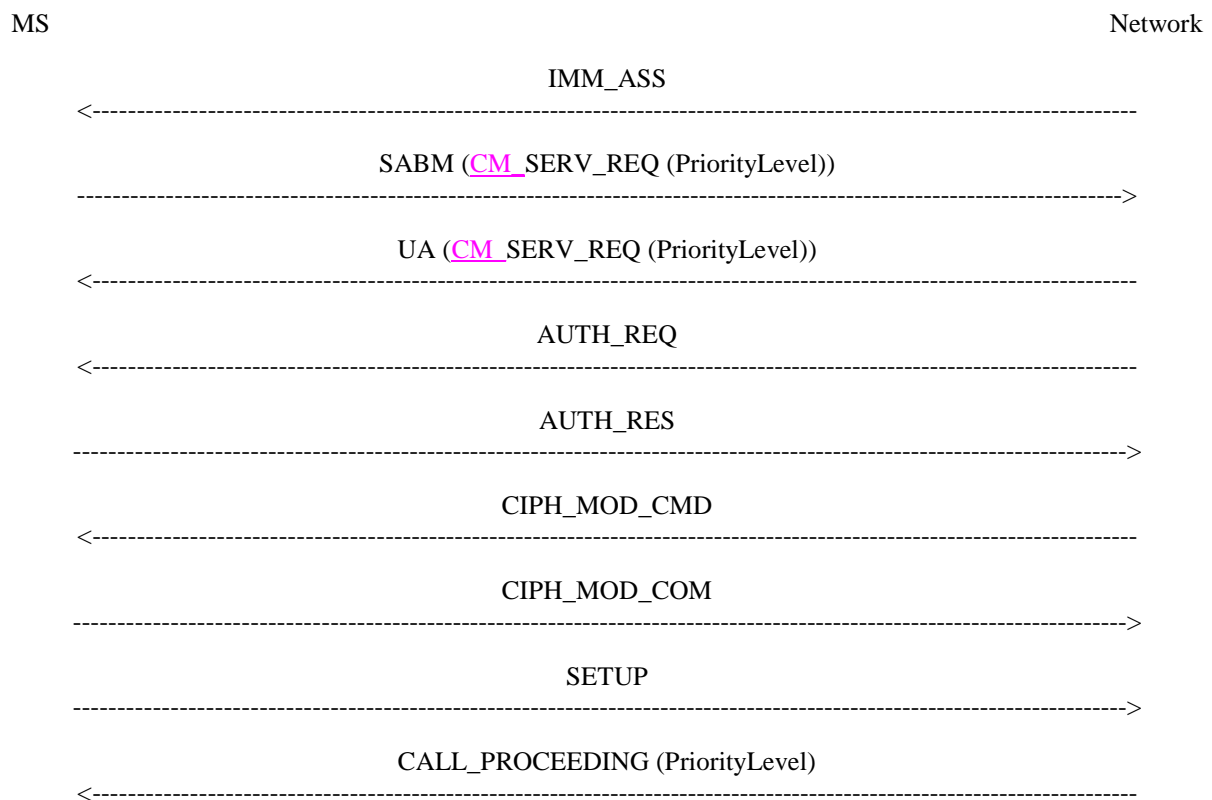
```
    MS                                                                                    Network

                                          IMM_ASS
         <----------------------------------------------------------------------------------------------

                              SABM (CM_SERV_REQ (PriorityLevel))
         ---------------------------------------------------------------------------------------------->

                               UA (CM_SERV_REQ (PriorityLevel))
         <----------------------------------------------------------------------------------------------

                                          AUTH_REQ
         <----------------------------------------------------------------------------------------------

                                          AUTH_RES
         ---------------------------------------------------------------------------------------------->

                                        CIPH_MOD_CMD
         <----------------------------------------------------------------------------------------------

                                        CIPH_MOD_COM
         ---------------------------------------------------------------------------------------------->

                                           SETUP
         ---------------------------------------------------------------------------------------------->

                                 CALL_PROCEEDING (PriorityLevel)
         <----------------------------------------------------------------------------------------------
```

Figure 1.1: Signalling information required for the prioritisation at mobile originating call establishment (in GSM mode)

IMM_ASS: Standard GSM Radio resource management message which is sent if no RR connection was already established.

SABM (CM_SERV_REQ (PriorityLevel)): L3-MM CM SERVICE REQUEST where the priority level information element is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible mobile station the mobile station shall send a service request message without priority level information element and the network shall apply a default priority to the request. The message may be piggybacked in a SABM if no RR connection was already established.

UA (CM_SERV_REQ (PriorityLevel): Standard message to acknowledge the layer 2 link which is sent if no RR connection was already established. The priority level is the same as received by the network.

AUTH_REQ: Standard message which is sent if the network applies authentication as shown in figure 1.1. If not, the network will sent a standard CM_SERVICE_ACCEPT message.

AUTH_RES: Standard message which is sent if the network applies authentication.

CIPH_MOD_CMD: Standard message which is sent if the network applies ciphering as shown in figure 1.1.

CIPH_MOD_COM: Standard message which is sent if the network applies ciphering.

SETUP: Standard message.

CALL_PROCEEDING: The network shall include the assigned priority level in a CALL_PROCEEDING ~~message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested~~. If the MS has indicated the priority in the CM_SERVICE_REQUEST message and if no priority level is included in the CALL_PROCEEDING message, then the MS shall assume that the network doesn't support priority.

For mobile originated calls in UMTS mode, the corresponding message flows are shown in figure 1.2.
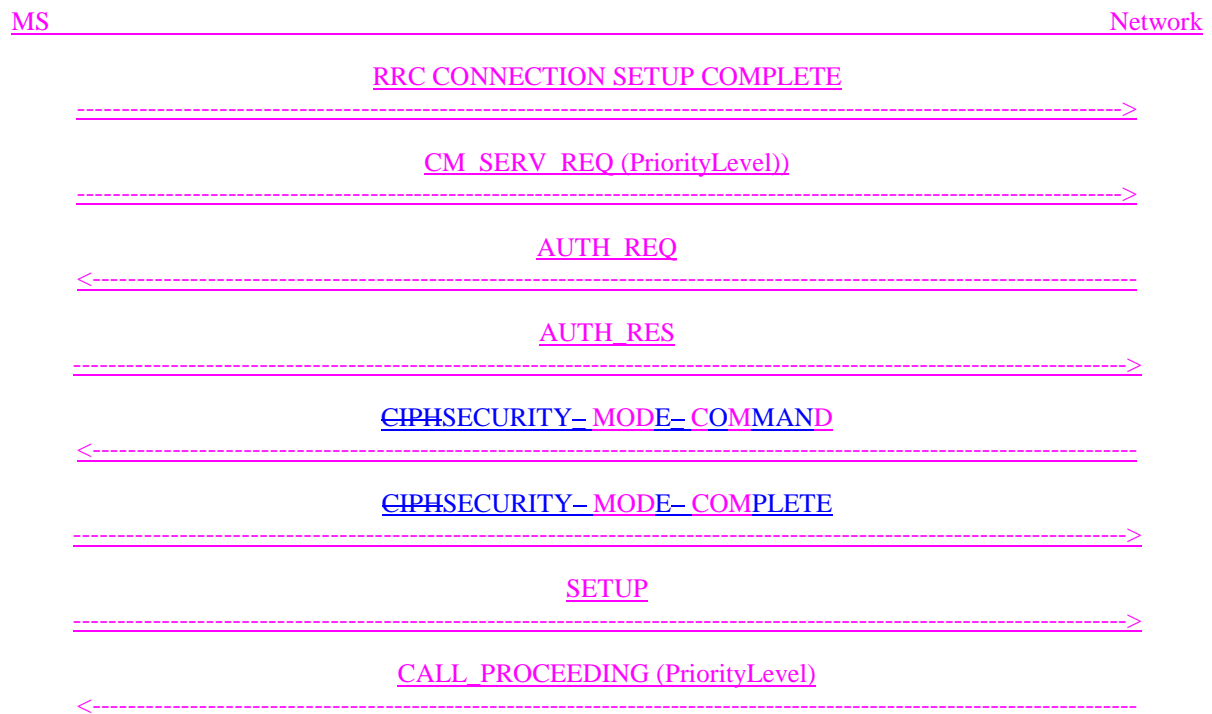
```
MS                                                                          Network

                        RRC CONNECTION SETUP COMPLETE
       ------------------------------------------------------------------------->

                           CM_SERV_REQ (PriorityLevel))
       ------------------------------------------------------------------------->

                                   AUTH_REQ
       <-------------------------------------------------------------------------

                                   AUTH_RES
       ------------------------------------------------------------------------->

                        CIPHSECURITY MODE COMMAND
       <-------------------------------------------------------------------------

                        CIPHSECURITY MODE COMPLETE
       ------------------------------------------------------------------------->

                                    SETUP
       ------------------------------------------------------------------------->

                          CALL_PROCEEDING (PriorityLevel)
       <-------------------------------------------------------------------------
```

Figure 1.2: Signalling information required for the prioritisation at mobile originating call establishment (in UMTS mode)

RRC CONNECTION SETUP COMPLETE: Standard UMTS Radio resource management message which is sent to confirm the establishment of the RRC Connection by the UE.

CM_SERV_REQ (PriorityLevel)): L3-MM CM SERVICE REQUEST where the priority level information element is provided in addition if a priority selection is performed by the user. In case of no priority selection or use of a non-compatible mobile station the mobile station shall send a service request message without priority level information element and the network shall apply a default priority to the request.

AUTH_REQ: Standard message ~~which is sent if the network applies authentication as shown in figure 1.2. If not, the network will sent a standard CM_SERVICE_ACCEPT message~~.

AUTH_RES: Standard message ~~which is sent if the network applies authentication~~.

CIPHSECURITY MODE COMMAND: Standard message which is sent if the network applies ciphering as shown in figure 1.2.

SECURITYCIPH MODE COMPLETE: Standard message which is sent if the network applies ciphering.

SETUP: Standard message.

CALL_PROCEEDING: The network shall include the assigned priority level in a CALL_PROCEEDING message if no priority level was indicated in the CM_SERVICE_REQUEST message or the assigned priority level is different to the one requested. If the MS has indicated the priority in the CM_SERVICE_REQUEST message and if no priority level is included in the CALL_PROCEEDING message, then the MS shall assume that the network doesn't support priority.