**3GPP TSG CN Plenary Meeting #20** **NP-030283**
**4th - 6th June 2003. HÄMEENLINNA, Finland.**

**Source:** **TSG CN WG 1**

**Title:** **CRs to Rel-5 on Work Item LATE_UE towards 23.009 and 29.018**

**Agenda item:** **8.9**

**Document for:** **APPROVAL**

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**Introduction:**

This document contains **2** CRs, **Rel-5 to** Work Item **"LATE_UE"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #20 for approval.

| Spec | CR | Rev | Cat | Phase | Subject | Version-Current | Version-New | Meeting-2nd-Level | Doc-2nd-Level |
|---|---|---|---|---|---|---|---|---|---|
| 23.009 | 097 | 2 | F | Rel-5 | Addition of UESBI-Iu to handover and relocation procedures | 5.4.0 | 5.5.0 | N1-30 | N1-030875 |
| 29.018 | 033 | | F | Rel-5 | Addition of IMEISV to BSSAP+-LOCATION-UPDATE-REQUEST message | 5.3.0 | 5.4.0 | N1-30 | N1-030709 |

CR-Form-v7

# CHANGE REQUEST

⌘ **29.018** **CR** **033** ⌘ **rev** **-** ⌘ Current version: **5.3.0** ⌘

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

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Addition of IMEISV to BSSAP+-LOCATION-UPDATE-REQUEST message |
| ***Source:*** | ⌘ | Vodafone |
| ***Work item code:*** | ⌘ | LATE_UE |
| ***Date:*** | ⌘ | 28/04/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | This CR is concerned with ensuring that the early UE handling feature is fully supported in the network when the Gs interface is used. In order to align with the work done in 3GPP SA2, it is necessary to pass the IMEISV from the SGSN to the MSC/VLR at the earliest opportunity, e.g. at location update. |
| ***Summary of change:*** | ⌘ | The location update for non-GPRS service procedure is updated to mandate the SGSN to include the IMEISV information element in the BSSAP+-LOCATION-UPDATE-REQUEST message.<br>Additionally, a reference to 23.195 has been added. |
| ***Consequences if not approved:*** | ⌘ | The stage three work for Early UE handling will not be complete and will thus not be aligned with the stage two. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 2.1, 6.2.1, 6.3, 17.1.11, 17.1.11.6 (new sub-clause) |

| ***Other specs affected:*** ⌘ | Y | N | |
|---|---|---|---|
| | | X | Other core specifications |
| | | | Test specifications |
| | | | O&M Specifications |

⌘

***Other comments:*** ⌘

**How to create CRs using this form:**
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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** FIRST MODIFIED SECTION **********

## 2.1 Normative references

[1] [Void]

[1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] [Void]

[3] [Void]

[4] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service description; Stage 1".

[5] 3GPP TS 23.003: "Numbering, addressing and identification".

[6] 3GPP TS 23.007: "Restoration procedures".

[6a] 3GPP TS 23.018: "Basic Call Handling; Technical realization".

[7] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[8] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[9] 3GPP TS 43.064: "Overall description of the GPRS radio interface; Stage 2".

[10] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[11] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[11a] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[12] 3GPP TS 44.064: "Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".

[13] 3GPP TS 44.065: "Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[14] 3GPP TS 48.008: "Mobile-services Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".

[15] 3GPP TS 48.018: "Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[16] 3GPP TS 48.060: "Inband control of remote transcoders and rate adaptors for Enhanced Full Rate (EFR) and full rate traffic channels."

[17] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[18] 3GPP TS 49.008: "Application of the Base Station System Application Part (BSSAP) on the E-interface".

[19] 3GPP TS 29.010: "Information Element Mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS-MCS) Signalling Procedures and the Mobile Application Part (MAP)".

[20] 3GPP TS 29.016: "General Packet Radio Service (GPRS); Serving GPRS Support Node (SGSN) - Visitors Location Register (VLR); Gs interface network service specification".

[21] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[22] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[23] 3GPP TS 23.195: "Provision of UE Specific Behaviour Information to Network Entities."

********** NEXT MODIFIED SECTION **********

## 6.2.1 Location Update Initiation

If timer T6-1 is not running, the SGSN shall start the Location Update for non-GPRS service procedure when it receives from the MS:

- An Attach request indicating combined IMSI and GPRS attach;
- An Attach request indicating GPRS attach while IMSI attached;
- A Combined Routeing and Location Area Update request indicating IMSI attach;
- A Combined Routeing and Location Area Update request indicating that the Location Area has changed;
- A Combined Routeing and Location Area Update request, if the state of the association is Gs-NULL; or
- A Combined Routeing and Location Area Update request when the SGSN serving the MS has changed.

The number of the VLR is derived from the RAI where the MS is camping. The SGSN starts Timer T6-1. The BSSAP+-LOCATION-UPDATE-REQUEST message includes the old Location Area Identifier received from the MS. The SGSN shall also include the new Location Area Identifier where the MS is currently camping. The new LAI is derived from the RAI.

The BSSAP+-LOCATION-UPDATE-REQUEST message includes the type of location update performed by the MS in the GPRS location update type IE. If the MS has performed a combined attach request or a combined routing and location area update request with IMSI attach, the SGSN indicates 'IMSI attach', otherwise the SGSN indicates 'Normal location update'.

The BSSAP+-LOCATION-UPDATE-REQUEST message shall include the TMSI status if received from the MS.

If the SGSN supports the "Provision of UE Specific Behaviour Information to Network Entities" (see 3GPP TS 23.195 [23]), the BSSAP+-LOCATION-UPDATE-REQUEST message shall include the IMEISV.

If timer T6-1 is running:

If the SGSN receives from the MS:

- An Attach request indicating combined IMSI and GPRS attach;
- An Attach request indicating GPRS attach while IMSI attached; or
- A Combined Routeing and Location Area Update request with or without IMSI attach.

Then:

- If the new LAI is the same as in the outstanding request, the SGSN shall not process this new request and shall wait for the VLR's response to the ongoing procedure; or
- If the new LAI is different but is in the same VLR as the outstanding request:
  - any response from the VLR to the oustanding request is ignored;
  - Timer T6-1 shall be stopped and reset; and
  - The SGSN shall start the Location Update for non-GPRS service procedure; or
- If the new LAI is different, and is in a different VLR to the outstanding request:
  - Any response from the previously addressed VLR to the oustanding request is ignored;

- Timer T6-1 shall be stopped and reset; and
- the SGSN shall start the Location Update for non-GPRS service procedure.

When the SGSN receives from the MS a Routeing Area Update request and the SGSN serving the MS has changed, the SGSN shall stop and reset timer T6-1.

********** NEXT MODIFIED SECTION **********

## 6.3 Procedures in the VLR

When a VLR receives a BSSAP+-LOCATION-UPDATE-REQUEST message it shall check whether the IMSI is known. If the IMSI is not known the VLR shall retrieve the MM context of the MS from the HLR.

For a VLR supporting the "Provision of UE Specific Behaviour Information to Network Entities" (see 3GPP TS 23.195 [23]) the following applies:

- The VLR shall store the IMEISV value received in the BSSAP+-LOCATION-UPDATE-REQUEST message in the MM context for that MS.
- If the VLR receives a BSSAP+-LOCATION-UPDATE-REQUEST message without IMEISV information element, the MSC/VLR shall request the IMEISV from the MS by means of a Direct Transfer or DTAP Identification procedure at the next Iu-cs or A interface connection establishment.

********** NEXT MODIFIED SECTION **********

## 17.1.11 BSSAP+-LOCATION-UPDATE-REQUEST message

This message is sent by the SGSN to the VLR either to request update of its location file (normal update) or to request IMSI attach.

**Table 17.1.11/3GPP TS 29.018: BSSAP+-LOCATION-UPDATE-REQUEST message content**

| Information Element | Type/Reference | Presence | Format | Length |
|---|---|---|---|---|
| Message type | Message type<br>18.2 | M | V | 1 |
| IMSI | IMSI<br>18.4.10 | M | TLV | 6-10 |
| SGSN number | SGSN number<br>18.4.22 | M | TLV | 5-11 |
| Update type | GPRS location update type<br>18.4.6 | M | TLV | 3 |
| New Cell global identity | Cell global identity<br>18.4.1 | M | TLV | 10 |
| Mobile station classmark | Mobile station classmark 1<br>18.4.18 | M | TLV | 3 |
| Old location area identifier | Location area identifier<br>18.4.14 | O | TLV | 7 |
| TMSI status | TMSI status<br>18.4.24 | O | TLV | 3 |
| New service area identification | Service area identification<br>18.4.21b | O | TLV | 9 |
| IMEISV | IMEISV<br>18.4.9 | O | TLV | 10 |

### 17.1.11.1 Old location area identifier

This information element should be included. It is derived from the old routing area identification received in the ROUTING AREA UPDATING REQUEST message defined in 3GPP TS 24.008.

### 17.1.11.2 New cell global identity

In A/Gb mode, the cell global identity which shall be included is the one where the MS is in the current radio contact.

In Iu mode, the cell global identity which shall be included indicates where the MS is in the current location area. The cell identity part of this information shall be ignored by the VLR.

### 17.1.11.3 TMSI status

This information element shall be included if the TMSI status received in the ATTACH REQUEST or ROUTING AREA UPDATING REQUEST message from the MS indicates, that no valid TMSI is available in the MS.

### 17.1.11.4 Mobile station classmark

This information element does not serve any useful purpose, but shall be included for reasons of compatibility with earlier versions of the protocol. To ease interworking with old VLR equipment, the SGSN shall encode the contents of this information element as: revision level 'GSM phase 2', 'early classmark sending supported', 'encryption algorithm A5/1 supported', and RF power capability 'class 1'.

### 17.1.11.5 New service area identification

In Iu mode, the service area identification which should be included is the one where the MS is in the current radio contact.

### 17.1.11.6 IMEISV

This information element shall be included, if the SGSN supports the "Provision of UE Specific Behaviour Information to Network Entities".

CR-Form-v7

# CHANGE REQUEST

⌘ **23.009** **CR** **097** ⌘ **rev** **2** ⌘ Current version: **5.4.0** ⌘

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

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Addition of UESBI-Iu to handover and relocation procedures |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | LATE_UE |
| ***Date:*** | ⌘ | 22/05/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
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|---|---|
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| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

***Reason for change:*** ⌘ In SA2#31 the signaling principles for the "Provision of UE Specific Behaviour Information to Network Entities"were agreed in TS 23.195 v 1.1.0.
Regarding handover and relocation procedures it was agreed that:

- UESBI-Iu shall be sent from anchor to target MSC in inter-MSC handover and relocation.
- Anchor MSC derives UESBI-Iu from IMEISV and forwards it to target MSC.
- Target MSC stores this value and forwards it to RNS-B in subsequent intra-MSC GSM to UMTS handovers and/or relocations.

***Summary of change:*** ⌘ UESBI-Iu added into basic and subsequent:

- intra-MSC inter-system GSM to UMTS handover,
- inter-MSC handovers, including inter-system handovers and,
- inter-MSC relocation
- intra-MSC relocation

***Consequences if not approved:*** ⌘ Misalignment with stage 2.

***Clauses affected:*** ⌘ 2, 3.1, 3.2, 4.1.1, 4.3.1, 4.4.1

| | | Y | N | | | |
|---|---|---|---|---|---|---|
| ***Other specs affected:*** | ⌘ | X | | Other core specifications | ⌘ | 29.002, 29.018, 29.010 |
| | | | X | Test specifications | | |
| | | | X | O&M Specifications | | |

| ***Other comments:*** | ⌘ | Endorsed in CN4 under Tdoc N4-030703 |
|---|---|---|

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**CHANGE 1**

# 2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*


[1] ITU-T Recommendation Q.118: "Abnormal conditions - Special release arrangements".

[2] Void.

[2a] 3GPP TR 21.905: "3G Vocabulary".

[3] 3GPP TS 43.068: "Voice Group Call Service (VGCS); Stage 2".

[4] 3GPP TS 45.008: "Radio Subsystem Link Control".

[5] 3GPP TS 48.008: "Mobile Switching Centre - Base Station System (MSC-BSS) Interface Layer 3 specification".

[6] 3GPP TS 48.058: "Base Station Controler - Base Transceiver Station (BSC-BTS) Interface Layer 3 specification".

[7] 3GPP TS 49.008: "Application of the Base Station System Application Part (BSSAP) on the E-interface".

[8] 3GPP TS 29.010: "Information Element Mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS-MSC); Signalling procedures and the Mobile Application Part (MAP)".

[9] 3GPP TS 22.129: "Handover Requirements between UMTS and GSM or other Radio Systems".

[10] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[11] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[12] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[13] 3GPP TS 25.303: "UE functions and inter-layer procedures in connected mode".

[14] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[15] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

[16] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[17] 3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes".

[19] 3GPP TS 23.221: "Architectural Requirements".

[20] 3GPP TS 25.401: "UTRAN Overall Description".

[21] 3GPP TS 23.195: "Provision of UE Specific Behaviour Information to Network Entities".

**CHANGE 2**

## 3.1 Abbreviations

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

| | |
|---|---|
| 3G_MSC | A third generation MSC that supports the Iu interface and optionally the A interface |
| 3G_MSC-A | The controlling 3G_MSC on which the call was originally established |
| 3G_MSC-B | The 3G_MSC to which the UE is handed over in a Basic Handover |
| 3G_MSC-B' | The 3G_MSC to which the UE is handed over in a Subsequent Handover |
| BSC | Base Station Controller |
| BSS | Base Station System |
| BSS-A | The BSS from which the MS is being handed over |
| BSS-B | The BSS to which the MS is being handed over |
| BTS | Base Transceiver Station |
| GERAN | GSM EDGE Radio Access Network |
| ISC | International Switching Centre |
| MS | Mobile Station |
| MSC | A second generation Mobile Services Switching Centre that only supports the A interface |
| MSC-A | The controlling MSC on which the call was originally established |
| MSC-B | The MSC to which the MS is handed over in a Basic Handover |
| MSC-B' | The MSC to which the MS is handed over in a Subsequent Handover |
| RNC | Radio Network Controller |
| RNS | Radio Network Subsystem |
| SBSS | Serving BSS |
| SNA | Shared Network Area |
| SRNS | Serving RNS |
| UE | A User Equipment is a terminal that supports USIM and the UMTS Uu interface |
| UE/MS | A terminal that supports USIM, SIM, the Uu interface and the Um interface |
| UESBI | UE Specific Behaviour Information |
| USIM | UMTS Subscriber Identity Module |

Other abbreviations used in the GSM specifications are listed in 3GPP TR 21.905[2a].

## 3.2 Definitions

The following terms are used in this Technical Specification:

**A/Gb mode**: mode of operation of the MS when connected to the Core Network via GERAN and the A and/or Gb interfaces. Throughout this specification the term GSM refers to GERAN A/Gb mode.

**Iu mode**: mode of operation of the MS when connected to the Core Network via GERAN or UTRAN and the Iu interface. Throughout this specification the term UMTS refers to UTRAN or GERAN Iu mode.

**Iur interface:** the logical interface between two UTRAN RNSs.

**Iur-g interface:** the logical interface between two BSSs or a BSC and an RNC and it is only considered in Iu mode.

**Currently used codec:** the codec used by the UE/MS before a handover or SRNS relocation.

**Selected codec:** the codec to be used by the UE/MS after the handover or SRNS relocation.

**Available Codecs List:** a list of codecs supported by the MS and by the core network, provided by MSC-A/3G_MSC-A to 3G_MSC-B during Inter-MSC handover/relocation. The Available Codecs List may contain separate list of codecs for UTRAN Iu mode and GERAN Iu mode. Within each list, the codecs are ordered in decreasing order of priority, the first entry in the list being the highest priority codec and the last entry the lowest priority codec.

**Default speech codec:** In UTRAN Iu mode the default speech codec is the UMTS AMR or UMTS AMR2 codec, dependent on the capabilities of the UE/MS. For a description of how the network determines the default UMTS speech codec, see [10], subclause 5.2.1.11. If necessary, 3G_MSC-B shall use the Radio Resource Information instead of the GSM Bearer Capability, since the GSM Bearer Capability is not available in MSC-B.

In GERAN Iu mode the default speech codec is the AMR FR codec.

**UE Specific Behaviour Information - Iu (UESBI-Iu)**: information that is sent from the MSC to the UTRAN and that can be used to derive specific information about the UE's capabilities.

## CHANGE 3

# 4.1 MSC-A

## 4.1.1 Role of MSC-A

In the Intra-MSC handover case, the MSC-A (simply termed MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-MSC handover. When BSSAP procedures have to be performed, they are initiated and driven by MSC-A.

In the Inter-MSC handover case, MSC-A is the MSC which controls the call and the mobility management of the Mobile during the call, before, during and after a basic or subsequent handover. When BSSAP procedures related to dedicated resources have to be performed towards the MS, they are initiated and driven by MSC-A. The MSC-A - MSC-B interface works as a MSC - BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures, described in 3GPP TS 49.008 [7] are only those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between MSC-A and the MS.

During a basic handover, MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

For handover to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, MSC-A can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

During a subsequent handover back to MSC-A, MSC-A acts as a BSS towards MSC-B, which controls the handover procedure until the termination in MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from MSC-A). Then all handover related messages shall terminate at MSC-A (e.g. Handover Detect/Complete from BSS-B, Handover Failure from BSS-A).

During a subsequent handover to a third MSC, MSC-A works towards MSC-B' as described above in the basic handover paragraph and towards MSC-B as described above in subsequent handover paragraph.

In the Inter-System, inter-MSC handover case, MSC-A is the MSC which controls the call and the mobility management of the Mobile during the call, before, during and after a basic or subsequent handover. When BSSAP procedures related to dedicated resources have to be performed towards the MS, they are initiated and driven by MSC-A. The MSC-A - 3G_MSC-B interface works as a MSC - BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures, described in 3GPP TS 49.008 [7] are only those related to dedicated resources. The DTAP signalling is relayed transparently by 3G_MSC-B between MSC-A and the MS.

During a basic inter-system handover, MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system handover back to MSC-A, MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from MSC-A). Then all handover related messages shall terminate at MSC-A (e.g. Handover Detect/Complete from BSS-B, Handover Failure from BSS-A).

During a subsequent inter-system handover to a third MSC, MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

If MSC-A supports the "Provision of UE Specific Behaviour Information to Network Entities" (see 3GPP TS 23.195 [21]), it shall send UESBI-Iu to the target MSC during basic and subsequent handover, and basic and subsequent inter-system handover.

**CHANGE 4**

### 4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP or BSSMAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In a network implementing the "Flexible Iu interface for handover/relocation" option, 3G_MSC-A may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-A can have multiple target CN nodes for each handover/relocation target in a pool-area as specified in 3GPP TS 23.236 [18].

In the case of intra-MSC handover of a speech call, 3G_MSC-A controls the transcoder in the core network. The 3G_MSC-A determines if a transcoder is required to be inserted or released in the CN.

In the case of Inter-3G_MSC relocation, 3G_MSC-A links out the transcoder.

In the Inter-3G_MSC relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE during the call, before, during and after a basic or subsequent relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - RNS interface for the RANAP procedures. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE.

During a successful relocation the order to perform location reporting at change of Service Area is not transferred to the target RNS. In the Intra-3G_MSC-A relocation case, the 3G_MSC-A re-issues the Location Reporting Control towards the target RNS. In the Inter-3G_MSC relocation case, 3G_MSC-A keeps the control of the Location Report Control procedure. However, re-issuing the Iu-LOCATION-REPORTING-CONTROL messages due to subsequent Intra-3G_MSC-B relocations is the responsibility of 3G_MSC-B.

During a basic relocation, 3G_MSC-A initiates and controls all the relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation Cancel from RNS-A).

During a subsequent relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic relocation paragraph and towards 3G_MSC-B as described above in subsequent relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in 3GPP TS 09 08 [7] are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system UMTS to GSM handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system UMTS to GSM handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation Cancel from RNS-A).

During a subsequent inter-system UMTS to GSM handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

During a basic inter-system GSM to UMTS handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system GSM to UMTS handover back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Handover Failure from BSS-A).

During a subsequent inter-system GSM to UMTS handover to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards MSC-B as described above in subsequent inter-system handover paragraph.

3G_MSC-A may assign a priority level defined as RAB parameter in 3GPP TS 25.413 [11] for each bearer. In case of relocation of a multicall configuration the 3G_MSC-B or the target RNC shall select the bearers to be handed over according to the priority level, if the target cell is not able to accommodate all bearers. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) 3G MSC-A shall send the SNA information to 3G_MSC-B except for emergency calls.

If 3G_MSC-A supports the optional supplementary service Multicall (See 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the Intra-3G_MSC relocation case, the 3G-MSC-A tries to relocate all bearers to a new RNS.
- In the basic relocation case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B. If 3G_MSC-A receives an indication that the 3G_MSC-B does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the subsequent relocation to a third 3G_MSC-B' case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B'. If 3G_MSC-A receives an indication that the 3G_MSC-B' does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the basic inter-system UMTS to GSM handover case, the 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.
- In all cases described above, 3G_MSC-A shall release some calls which has been carried by the bearers failed to set up in new RNS or the bearers not to be handed over.

If 3G_MSC-A supports the "Provision of UE Specific Behaviour Information to Network Entities" (see 3GPP TS 23.195 [21]), it shall send UESBI-Iu to the RNS-B during intra-3G_MSC handover/relocation and during subsequent inter-3G_MSC handover/relocation back to 3G_MSC-A. Furthermore, 3G_MSC-A shall send UESBI-Iu to the target MSC during basic and subsequent inter-MSC handover, and basic and subsequent inter-3G_MSC handover/relocation.

## CHANGE 5

### 4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure. 3G_MSC-B notifies MSC-A or 3G_MSC-A of intra-3G_MSC-B InterSystem handover and intra GSM handovers, by using the A-HANDOVER-PERFORMED message.

- If the security algorithms have been changed during an intra-3G_MSC-B SRNS relocation; or
- if the selected codec type or codec modes have been changed during this relocation and the Available Codecs List was received by 3G_MSC-B before,

then 3G_MSC-B shall indicate the changed parameters, i.e. the selected UMTS algorithm(s) and/or the selected codec type and codec modes, to MSC-A or 3G_MSC-A in the MAP-PROCESS-ACCESS-SIGNALLING request.

Encapsulated in the MAP-PROCESS-ACCESS-SIGNALLING request 3G_MSC-B shall send:

- an A-HANDOVER-PERFORMED message, when encapsulated BSSAP is used on the E interface; or
- an Iu-LOCATION-REPORT message, when encapsulated RANAP is used on the E interface.

On reception of an order to perform location reporting at change of Service Area from 3G_MSC-A, 3G_MSC-B shall be responsible to re-issue the Iu-LOCATION-REPORTING-CONTROL message after subsequent Intra-3G_MSC-B relocations/handovers. This shall be performed immediately after the successful completion of the Relocation Resource Allocation procedure.

In a network implementing the "Flexible Iu interface for handover/relocation" option, in the Intra-3G_MSC handover/relocation case, 3G_MSC-B may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For subsequent inter-MSC handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-B can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

The role of 3G_MSC-B is also to provide transcoder resources. For speech calls in UMTS, 3G_MSC-B shall select a codec from the Available Codecs List provided by MSC-A/3G_MSC-A in the MAP-PREPARE-HANDOVER request. If the Available Codecs List was not received, 3G_MSC-B shall select the appropriate default speech codec.

If an intra-3G_MSC-B intersystem handover to UMTS is performed, and the Available Codecs List was received by 3G_MSC-B during the basic inter MSC handover/relocation procedure, then 3G_MSC-B shall indicate the selected codec to MSC-A or 3G_MSC-A in MAP-PROCESS-ACCESS-SIGNALLING request.

In the Inter-3G_MSC relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the BSSMAP information received on the A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its BSSs to the extent that 3G_MSC-B is responsible for

the connections of its BSSs. The release of the dedicated resources between 3G_MSC-B and BSS-B is under the responsibility of 3G_MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

At intra-PLMN handover/relocation, 3G_MSC-B shall send Service Handover related information to the BSC/RNC if and only if this Service Handover information is received from 3G_MSC-A. 3G_MSC-B shall not modify Service Handover related information received from a 3G_MSC-A within the same PLMN.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) when SNA information is received by 3G_MSC-B from 3G_MSC-A, 3G MSC-B shall send the SNA information to the RNS.

If 3G_MSC-B does not support the optional supplementary service Mutlicall (see 3GPP TS 23.135) and 3G_MSC-A requests to relocate multiple bearers, 3G_MSC-B shall indicate that it does not support multiple bearers to 3G_MSC-A.

If 3G_MSC-B supports the optional supplementary service Multicall (see 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the basic relocation case, the 3G_MSC-B shall be able to allocate a Handover Number for each bearer. The 3G_MSC-B shall also be able to select some bearers to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] so that the number of bearers will fulfill the maximum number of bearers supported by the 3G_MSC-B. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

- In the Intra-3G_MSC relocation case, the 3G_MSC-B tries to relocate all bearers to a new RNS.

- In the subsequent relocation back to the 3G_MSC-A or to a third 3G_MSC-B' case, the 3G_MSC-B tries to request to the 3G_MSC-A to relocate all bearers to the 3G_MSC-A or to the 3G_MSC-B'.

- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the subsequent inter-system UMTS to GSM handover back to the 3G_MSC-A or to a third MSC-B' case, the 3G_MSC-B shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.

If 3G_MSC-B supports the "Provision of UE Specific Behaviour Information to Network Entities" (see 3GPP TS 23.195 [21]), and if it received UESBI-Iu from MSC-A or 3G_MSC-A during the basic inter-MSC handover/relocation, then 3G_MSC-B shall store the UESBI-Iu and forward it to RNS-B during basic inter-MSC handover/relocation and subsequent intra-3G_MSC-B handover/relocation.