3GPP TSG CN Plenary **Tdoc NP-000643**
Meeting #10, Bangkok, Thailand
6th – 8th December 2000

Source: **TSG_CN WG 4**

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

Agenda item: **7.15**

Document for: **APPROVAL**

Introduction:

This document contains 14 CRs on R99 Work Item Handover, 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	N4-001079	29.002	209		R99	3.6.0	Transport of long RANAP messages on MAP-E interface	F
CN10	N4-001095	29.002	212		Rel-4	4.1.0	Transport of long RANAP messages on MAP-E interface	A
CN10	N4-000915	29.010	008		R99	3.3.0	GSM to 3G Handover: Location Reporting in 3G_MSC-B	F
CN10	N4-000916	29.010	009		R99	3.3.0	GSM to 3G Handover: Chosen IEs in Handover Request Ack	F
CN10	N4-000917	29.010	010		R99	3.3.0	GSM to 3G Handover: MAP parameter Target Cell ID	F
CN10	N4-000920	29.002	197		R99	3.6.0	ASN.1 description of targetCellId	F
CN10	N4-000921	29.002	198		Rel-4	4.1.0	ASN.1 description of targetCellId	A
CN10	N4-001070	29.002	195	1	R99	3.6.0	GSM to 3G Handover: MAP parameter Target Cell ID	F
CN10	N4-001071	29.002	196	1	Rel-4	4.1.0	GSM to 3G Handover: MAP parameter Target Cell ID	A
CN10	N4-001072	29.002	199	1	R99	3.6.0	IMSI in MAP_PREPARE_HANDOVER	F
CN10	N4-001073	29.002	200	1	Rel-4	4.1.0	IMSI in MAP_PREPARE_HANDOVER	A
CN10	N4-001074	29.010	011	1	R99	3.3.0	GSM/UMTS Interworking: Mapping of cause codes	F
CN10	N4-001075	29.002	207	1	R99	3.6.0	Alignment of the Target RNC-ID	F
CN10	N4-001076	29.002	208	1	Rel-4	4.1.0	Alignment of the Target RNC-ID	A

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CHANGE REQUEST

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29.002	CR	195r1	Current Version:	3.6.0

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	strategic		*(for SMG use only)*
	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: *(at least one should be marked with an X)*	(U)SIM		ME		UTRAN / Radio		Core Network	X

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

Subject: GSM to 3G Handover: MAP parameter Target Cell ID

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:

Non-critical CR supported by consensus in the meeting.

The MAP parameter Target Cell ID in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER is not applicable in case of inter-system handover GSM to UMTS. Target RNC ID is included in the IE Cell Identifier (Target) in the BSSAP message Handover Request and there is no need to send it also as a MAP parameter.
It is proposed that neither the MAP parameter Target Cell Id nor the Target RNC Id shall be included in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER in case of inter-system handover GSM to UMTS.

Clauses affected: 8.4.1.3, 8.4.5.3, 19.2.2.1

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	23.009 CR014, 29.010CR010
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:

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

First Modified Section

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Next Modified Section

8.4.5 MAP_PREPARE_SUBSEQUENT_HANDOVER service

8.4.5.1 Definition

This service is used between MSC-B and MSC-A (E-interface) to inform MSC-A that it has been decided that a handover or relocation to either MSC-A or a third MSC (MSC-B') is required.

The MAP_PREPARE_SUBSEQUENT_HANDOVER service is a confirmed service using the primitives from table 8.4/5.

8.4.5.2 Service primitives

Table 8.4/5: MAP_PREPARE_SUBSEQUENT_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
Target MSC Number	M	M(=)		
Selected RAB ID	C	C(=)		
AN-APDU	M	M(=)	C	C(=)
User error			C	C(=)
Provider error				O

8.4.5.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter shall be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Next Modified Section

19.2.2 Handover procedure in MSC-A

This subclause describes the handover or relocation procedure in MSC-A, including the request for a basic handover or relocation to another MSC (MSC-B), subsequent handover or relocation to a third MSC (MSC-B') or back to the controlling MSC (MSC-A).

19.2.2.1 Basic handover

When MSC-A has decided that a call has to be handed over or relocated to MSC-B, the Handover Control Application in MSC-A requests the MAP application to initiate the MAP_PREPARE_HANDOVER request to MSC-B.

MSC-A opens the dialogue to MSC-B with a MAP_OPEN request containing no user specific parameters and sends a MAP_PREPARE_HANDOVER request. This request shall contain all the information required by MSC-B to allocate the necessary radio resources. In addition, it may optionally contain:

- an indication that a handover number allocation is not required;~~,~~
- the targetCellId, for compatibility reasons in the case of handover (except for inter-system handover from GSM to UMTS);~~, and all information required by MSC-B to allocate the necessary radio resources. The request may also contain~~
- the IMSI;~~,~~
- UMTS encryption information and UMTS integrity protection information, ~~that~~ which are necessary parameters for inter-system handover from GSM to UMTS~~.~~;
- GSM radio resource information (channel type) ~~may be included~~ for inter-system handover from UMTS to GSM.

The conditions when these parameters shall be included are described in detail in 3G TS 23.009.

If MSC-B accepts the dialogue, it returns a MAP_PREPARE_HANDOVER confirmation containing a handover number or one or several relocation numbers, unless the request has included the HO-NumberNotRequired parameter, and BSSAP or RANAP information which is forwarded to and handled by the Handover Control Application in MSC-A.

Optionally MSC-A can receive, after a MAP_PREPARE_HANDOVER confirmation, a MAP_PROCESS_ACCESS_SIGNALLING indication containing BSSAP or RANAP information.

When the connection has been established between the MS and MSC-B, MSC-A will be informed by a MAP_SEND_END_SIGNAL indication.

When MSC-A wants to clear the connection with BSS-B, an indication from the Handover Control Application is received in the Map Application to send the MAP_SEND_END-SIGNAL response to MSC-B to close the MAP dialogue.

MSC-A may abort the handover or relocation procedure at any time (e.g. if the call is cleared).

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CHANGE REQUEST

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29.002	CR	196r1	Current Version:	4.1.0

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: GSM to 3G Handover: MAP parameter Target Cell ID

Work item: Handover

Category: *(only one category shall be marked with an X)*

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

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	
Release 00	X

Reason for change:
The MAP parameter Target Cell ID in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER is not applicable in case of inter-system handover GSM to UMTS. Target RNC ID is included in the IE Cell Identifier (Target) in the BSSAP message Handover Request and there is no need to send it also as a MAP parameter.
It is proposed that neither the MAP parameter Target Cell Id nor the Target RNC Id shall be included in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER in case of inter-system handover GSM to UMTS.

Clauses affected: 8.4.1.3, 8.4.5.3, 19.2.2.1

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	23.009CR014, 29.010CR010
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:

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

First Modified Section

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Next Modified Section

8.4.5 MAP_PREPARE_SUBSEQUENT_HANDOVER service

8.4.5.1 Definition

This service is used between MSC-B and MSC-A (E-interface) to inform MSC-A that it has been decided that a handover or relocation to either MSC-A or a third MSC (MSC-B') is required.

The MAP_PREPARE_SUBSEQUENT_HANDOVER service is a confirmed service using the primitives from table 8.4/5.

8.4.5.2 Service primitives

Table 8.4/5: MAP_PREPARE_SUBSEQUENT_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
Target MSC Number	M	M(=)		
Selected RAB ID	C	C(=)		
AN-APDU	M	M(=)	C	C(=)
User error			C	C(=)
Provider error				O

8.4.5.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter shall be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Next Modified Section

19.2.2 Handover procedure in MSC-A

This subclause describes the handover or relocation procedure in MSC-A, including the request for a basic handover or relocation to another MSC (MSC-B), subsequent handover or relocation to a third MSC (MSC-B') or back to the controlling MSC (MSC-A).

19.2.2.1 Basic handover

When MSC-A has decided that a call has to be handed over or relocated to MSC-B, the Handover Control Application in MSC-A requests the MAP application to initiate the MAP_PREPARE_HANDOVER request to MSC-B.

MSC-A opens the dialogue to MSC-B with a MAP_OPEN request containing no user specific parameters and sends a MAP_PREPARE_HANDOVER request. This request shall contain all the information required by MSC-B to allocate the necessary radio resources. In addition, it may optionally contain:

- an indication that a handover number allocation is not required;
- the targetCellId, for compatibility reasons in the case of handover (except for inter-system handover from GSM to UMTS); ~~and all the information required by MSC-B to allocate thee necessary radio resources. The request may also contain~~
- the IMSI;
- UMTS encryption information and UMTS integrity protection information, ~~that~~ which are necessary parameters for inter-system handover from GSM to UMTS;
- GSM radio resource information (channel type) ~~may be included~~ for inter-system handover from UMTS to GSM.

The conditions when these parameters shall be included are described in detail in 3G TS 23.009.

If MSC-B accepts the dialogue, it returns a MAP_PREPARE_HANDOVER confirmation containing a handover number or one or several relocation numbers, unless the request has included the HO-NumberNotRequired parameter, and BSSAP or RANAP information which is forwarded to and handled by the Handover Control Application in MSC-A.

Optionally MSC-A can receive, after a MAP_PREPARE_HANDOVER confirmation, a MAP_PROCESS_ACCESS_SIGNALLING indication containing BSSAP or RANAP information.

When the connection has been established between the MS and MSC-B, MSC-A will be informed by a MAP_SEND_END_SIGNAL indication.

When MSC-A wants to clear the connection with BSS-B, an indication from the Handover Control Application is received in the Map Application to send the MAP_SEND_END-SIGNAL response to MSC-B to close the MAP dialogue.

MSC-A may abort the handover or relocation procedure at any time (e.g. if the call is cleared).

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CHANGE REQUEST

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29.002	CR	197	Current Version:	3.6.0

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

For submission to:	CN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: ASN.1 description of targetCellId

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:

Critical CR.

By introduction of RANAP support on the E-interface according to CR 095r1 (N2B000322), the Target Cell ID is changed from Mandatory to Conditional in MAP_PREPARE_SUBSEQUENT_HANDOVER in Chapter 8.4.5.2. The corresponding correction should also be included in the ASN.1 description.

Clauses affected: 17.7.1

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:


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First Modified Section

17.7 MAP constants and data types

17.7.1 Mobile Service data types

…….

-- handover types

```
ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    integrityProtectionInfo          [0] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                   [1] EncryptionInformation           OPTIONAL,
    extensionContainer               [2]  ExtensionContainer            OPTIONAL,
    ...}
```

```
PrepareHO-Arg ::= [3] SEQUENCE {
    targetCellId                     [0] GlobalCellId                   OPTIONAL,
    ho-NumberNotRequired             NULL                               OPTIONAL,
    targetRNCId                      [1] RNCId                          OPTIONAL,
    an-APDU                          [2] AccessNetworkSignalInfo        OPTIONAL,
    multipleBearerRequested          [3] NULL                           OPTIONAL,
    imsi                             [4] IMSI                           OPTIONAL,
    integrityProtectionInfo          [5] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                   [6] EncryptionInformation           OPTIONAL,
    radioResourceInformation         [7] RadioResourceInformation       OPTIONAL,
    extensionContainer               [8] ExtensionContainer             OPTIONAL,
    ...}
```

```
PrepareHO-Res ::= [3] SEQUENCE {
    handoverNumber                   [0] ISDN-AddressString             OPTIONAL,
    relocationNumberList             [1]  RelocationNumberList          OPTIONAL,
    an-APDU                          [2]  AccessNetworkSignalInfo       OPTIONAL,
    multicallBearerInfo              [3]  MulticallBearerInfo           OPTIONAL,
    multipleBearerNotSupported       NULL                               OPTIONAL,
    extensionContainer               [4]  ExtensionContainer            OPTIONAL,
    ...}
```

```
PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
    targetCellId                     [0] GlobalCellId,                  OPTIONAL,
    targetMSC-Number                 [1] ISDN-AddressString,
    targetRNCId                      [2] RNCId                          OPTIONAL,
    an-APDU                          [3]  AccessNetworkSignalInfo       OPTIONAL,
    selectedRab-Id                   [4]  RAB-Id                        OPTIONAL,
    extensionContainer               [5]  ExtensionContainer            OPTIONAL,
    ...}
```

```
PrepareSubsequentHO-Res ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer            OPTIONAL,
    ...}
```

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CHANGE REQUEST

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29.002	CR	198	Current Version:	4.1.0

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

For submission to:	CN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: ASN.1 description of targetCellId

Work item: Handover

Category: *(only one category shall be marked with an X)*

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

Reason for change: By introduction of RANAP support on the E-interface according to CR 095r1 (N2B000322), the Target Cell ID is changed from Mandatory to Conditional in MAP_PREPARE_SUBSEQUENT_HANDOVER in Chapter 8.4.5.2. The corresponding correction should also be included in the ASN.1 description.

Clauses affected: 17.7.1

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:


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First Modified Section

17.7 MAP constants and data types

17.7.1 Mobile Service data types

…….

```
-- handover types

ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
     an-APDU                          AccessNetworkSignalInfo,
     integrityProtectionInfo          [0] IntegrityProtectionInformation  OPTIONAL,
     encryptionInfo                   [1] EncryptionInformation           OPTIONAL,
     extensionContainer               [2]  ExtensionContainer            OPTIONAL,
     ...}

PrepareHO-Arg ::= [3] SEQUENCE {
     targetCellId                     [0] GlobalCellId                   OPTIONAL,
     ho-NumberNotRequired             NULL                               OPTIONAL,
     targetRNCId                      [1] RNCId                          OPTIONAL,
     an-APDU                          [2] AccessNetworkSignalInfo        OPTIONAL,
     multipleBearerRequested          [3] NULL                           OPTIONAL,
     imsi                             [4] IMSI                           OPTIONAL,
     integrityProtectionInfo          [5] IntegrityProtectionInformation  OPTIONAL,
     encryptionInfo                   [6] EncryptionInformation           OPTIONAL,
     radioResourceInformation         [7] RadioResourceInformation       OPTIONAL,
     extensionContainer               [8] ExtensionContainer             OPTIONAL,
     ...}

PrepareHO-Res ::= [3] SEQUENCE {
     handoverNumber                   [0] ISDN-AddressString             OPTIONAL,
     relocationNumberList             [1]  RelocationNumberList          OPTIONAL,
     an-APDU                          [2]  AccessNetworkSignalInfo       OPTIONAL,
     multicallBearerInfo              [3]  MulticallBearerInfo           OPTIONAL,
     multipleBearerNotSupported       NULL                               OPTIONAL,
     extensionContainer               [4]  ExtensionContainer            OPTIONAL,
     ...}

PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
     targetCellId                     [0] GlobalCellId,                  OPTIONAL,
     targetMSC-Number                 [1] ISDN-AddressString,
     targetRNCId                      [2] RNCId                          OPTIONAL,
     an-APDU                          [3]  AccessNetworkSignalInfo       OPTIONAL,
     selectedRab-Id                   [4]  RAB-Id                        OPTIONAL,
     extensionContainer               [5]  ExtensionContainer            OPTIONAL,
     ...}

PrepareSubsequentHO-Res ::= [3] SEQUENCE {
     an-APDU                          AccessNetworkSignalInfo,
     extensionContainer               [0]  ExtensionContainer            OPTIONAL,
     ...}
```

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CHANGE REQUEST

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

29.002	CR	199r1	Current Version:	3.6.0

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	strategic		*(for SMG use only)*
	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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: IMSI in MAP_PREPARE_HANDOVER

Work item: Handover

Category: *(only one category shall be marked with an X)*

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: Critical CR:
IMSI can only be included in MAP_PREPARE_HANDOVER if available. It is possible to set up an emergency call without IMSI.

Clauses affected: 8.4.1.3

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:

help.doc

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

First Modified Section

8.4 Handover services

It should be noted that the handover services used on the B-interface have not been updated for Release 99. The B-interface is not fully operational specified. It is strongly recommended not to implement the B-interface as an external interface.

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

HO-Number Not Required

For definition of this parameter see subclause 7.6.6.

IMSI

For definition of this parameter see subclause 7.6.2. This UMTS parameter shall be included if:

- it is available and
- if the access network protocol is BSSAP and
- there is an indication that the MS also supports UMTS.

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CN#05 Meeting , Paris, FRANCE
13th November – 17th November 2000

Document N4-001073
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

29.002	CR	200r1	Current Version:	4.1.0

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	strategic		*(for SMG use only)*
	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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: IMSI in MAP_PREPARE_HANDOVER

Work item: Handover

Category: *(only one category shall be marked with an X)*

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

Reason for change: IMSI can only be included in MAP_PREPARE_HANDOVER if available. It is possible to set up an emergency call without IMSI.

Clauses affected: 8.4.1.3

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:

help.doc

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

First Modified Section

8.4 Handover services

It should be noted that the handover services used on the B-interface have not been updated for Release 99. The B-interface is not fully operational specified. It is strongly recommended not to implement the B-interface as an external interface.

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see subclause 7.6.1.

Target Cell Id

For definition of this parameter see subclause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see subclause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure described in 3G TS 23.009.

HO-Number Not Required

For definition of this parameter see subclause 7.6.6.

IMSI

For definition of this parameter see subclause 7.6.2. This UMTS parameter shall be included if:

- available and
- ~~if~~ the access network protocol is BSSAP and
- there is an indication that the MS also supports UMTS.

3GPP TSG CN4 Meeting #5
Paris, 13th November - 17th November 2000

Document N4-001075

CHANGE REQUEST

29.002	CR	207r1	Current Version:	3.6.0

For submission to: CN#10 | for approval [X] | for information [ ] | strategic [X] | 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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: CN4 **Date:** 2000-11-16

Subject: Alignment of the Target RNC-ID

Work item: Handover

Category:

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 00	[ ]

Reason for change:

Critical CR.

The structure of the Target RNC-ID used in TS 25.413 has been changed to be in the format PLMN-ID+LAC+RNC-ID.

The structure of the Target RNC-ID used in TS 29.002 is still PLMN-ID +RNC-ID and therefore it shall be aligned.

Clauses affected: 17.7.1

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:

17.7.1 Mobile Service data types

…

```
-- gprs location registration types

UpdateGprsLocationArg ::= SEQUENCE {
    imsi                            IMSI,
    sgsn-Number                     ISDN-AddressString,
    sgsn-Address                    GSN-Address,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ... ,
    sgsn-Capability                 [0] SGSN-Capability             OPTIONAL }

SGSN-Capability ::= SEQUENCE{
    solsaSupportIndicator           NULL                            OPTIONAL,
    extensionContainer              [1] ExtensionContainer          OPTIONAL,
    ... ,
    superChargerSupportedInServingNetworkEntity   [2] SuperChargerInfo     OPTIONAL ,
    gprsEnhancementsSupportIndicator     [3] NULL                   OPTIONAL,
    supportedCamelPhases            [4] SupportedCamelPhases        OPTIONAL }

GSN-Address ::= OCTET STRING (SIZE (5..17))
    -- Octets are coded according to TS GSM 03.03

UpdateGprsLocationRes ::= SEQUENCE {
    hlr-Number                      ISDN-AddressString,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}

-- handover types

ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                         AccessNetworkSignalInfo,
    integrityProtectionInfo         [0] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                  [1] EncryptionInformation           OPTIONAL,
    extensionContainer              [2]  ExtensionContainer         OPTIONAL,
    ...}

PrepareHO-Arg ::= [3] SEQUENCE {
    targetCellId                    [0] GlobalCellId                OPTIONAL,
    ho-NumberNotRequired            NULL                            OPTIONAL,
    targetRNCId                     [1] RNCId                       OPTIONAL,
    an-APDU                         [2] AccessNetworkSignalInfo     OPTIONAL,
    multipleBearerRequested         [3] NULL                        OPTIONAL,
    imsi                            [4] IMSI                        OPTIONAL,
    integrityProtectionInfo         [5] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                  [6] EncryptionInformation           OPTIONAL,
    radioResourceInformation        [7] RadioResourceInformation    OPTIONAL,
    extensionContainer              [8] ExtensionContainer          OPTIONAL,
    ...}

PrepareHO-Res ::= [3] SEQUENCE {
    handoverNumber                  [0] ISDN-AddressString          OPTIONAL,
    relocationNumberList            [1]  RelocationNumberList       OPTIONAL,
    an-APDU                         [2]  AccessNetworkSignalInfo    OPTIONAL,
    multicallBearerInfo             [3]  MulticallBearerInfo        OPTIONAL,
    multipleBearerNotSupported      NULL                            OPTIONAL,
    extensionContainer              [4]  ExtensionContainer         OPTIONAL,
    ...}

PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
    targetCellId                    [0] GlobalCellId,
    targetMSC-Number                [1] ISDN-AddressString,
    targetRNCId                     [2] RNCId                       OPTIONAL,
    an-APDU                         [3]  AccessNetworkSignalInfo    OPTIONAL,
    selectedRab-Id                  [4]  RAB-Id                     OPTIONAL,
    extensionContainer              [5]  ExtensionContainer         OPTIONAL,
    ...}
```

```
PrepareSubsequentHO-Res ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
ProcessAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
SendEndSignal-Arg ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
SendEndSignal-Res ::= SEQUENCE {
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
RNCId ::= OCTET STRING (SIZE (75))
    -- Refers to the Target RNC-ID in the Target ID in 3G TS 25.413, where the encoding is
    -- defined.
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321             Mobile Country Code 1st digit
    --          bits 8765             Mobile Country Code 2nd digit
    -- octet 2 bits 4321             Mobile Country Code 3rd digit
    --          bits 8765             Mobile Network Code 3rd digit
    --                                or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321             Mobile Network Code 1st digit
    --          bits 8765             Mobile Network Code 2nd digit
    -- octets 4 and 5                RNC ID
```

```
RelocationNumberList ::= SEQUENCE SIZE (1..maxNumOfRelocationNumber) OF
                                      RelocationNumber
```

```
MulticallBearerInfo ::= INTEGER (1..maxNumOfRelocationNumber)
```

```
RelocationNumber ::= SEQUENCE {
    handoverNumber                   ISDN-AddressString,
    rab-Id                           RAB-Id,
    -- RAB Identity is needed to relate the calls with the radio access bearers.
    ...}
```

```
RAB-Id ::= INTEGER (1..maxNrOfRABs)
```

```
maxNrOfRABs INTEGER ::= 256
```

```
maxNumOfRelocationNumber  INTEGER ::= 7
```

```
RadioResourceInformation ::= OCTET STRING (SIZE (5..10))
    -- Octets are coded according the Channel Type information element in GSM 08.08
```

```
IntegrityProtectionInformation ::= OCTET STRING (SIZE (17..maxNumOfIntegrityInfo))
    -- Octets are coded according to 3G TS 25.413
```

```
maxNumOfIntegrityInfo INTEGER ::= 100
```

```
EncryptionInformation ::= OCTET STRING (SIZE (17..maxNumOfEncryptionInfo))
    -- Octets are coded according to 3G TS 25.413
```

```
maxNumOfEncryptionInfo INTEGER ::= 100
```

```
-- authentication management types
```

…

3GPP TSG CN4 Meeting #5
Paris, 13th November - 17th November 2000

Document N4-001076

CHANGE REQUEST

29.002	CR	208r1	Current Version:	4.1.0

For submission to: CN#10 — for approval [X] — for information [ ] — strategic [X] — 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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: CN4 **Date:** 2000-11-16

Subject: Alignment of the Target RNC-ID

Work item: Handover

Category:

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

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[ ]
Release 00	[X]

Reason for change:

The structure of the Target RNC-ID used in TS 25.413 has been changed to be in the format PLMN-ID+LAC+RNC-ID.

The structure of the Target RNC-ID used in TS 29.002 is still PLMN-ID +RNC-ID and therefore it shall be aligned.

Clauses affected: 17.7.1

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:

17.7.1 Mobile Service data types

…

```
-- gprs location registration types

UpdateGprsLocationArg ::= SEQUENCE {
    imsi                            IMSI,
    sgsn-Number                     ISDN-AddressString,
    sgsn-Address                    GSN-Address,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ... ,
    sgsn-Capability                 [0] SGSN-Capability             OPTIONAL }

SGSN-Capability ::= SEQUENCE{
    solsaSupportIndicator           NULL                            OPTIONAL,
    extensionContainer              [1] ExtensionContainer          OPTIONAL,
    ... ,
    superChargerSupportedInServingNetworkEntity   [2] SuperChargerInfo     OPTIONAL ,
    gprsEnhancementsSupportIndicator     [3] NULL                   OPTIONAL,
    supportedCamelPhases            [4] SupportedCamelPhases        OPTIONAL }

GSN-Address ::= OCTET STRING (SIZE (5..17))
    -- Octets are coded according to TS GSM 03.03

UpdateGprsLocationRes ::= SEQUENCE {
    hlr-Number                      ISDN-AddressString,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}

-- handover types

ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                         AccessNetworkSignalInfo,
    integrityProtectionInfo         [0] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                  [1] EncryptionInformation           OPTIONAL,
    extensionContainer              [2]  ExtensionContainer         OPTIONAL,
    ...}

PrepareHO-Arg ::= [3] SEQUENCE {
    targetCellId                    [0] GlobalCellId                OPTIONAL,
    ho-NumberNotRequired            NULL                            OPTIONAL,
    targetRNCId                     [1] RNCId                       OPTIONAL,
    an-APDU                         [2] AccessNetworkSignalInfo     OPTIONAL,
    multipleBearerRequested         [3] NULL                        OPTIONAL,
    imsi                            [4] IMSI                        OPTIONAL,
    integrityProtectionInfo         [5] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                  [6] EncryptionInformation           OPTIONAL,
    radioResourceInformation        [7] RadioResourceInformation    OPTIONAL,
    extensionContainer              [8] ExtensionContainer          OPTIONAL,
    ...}

PrepareHO-Res ::= [3] SEQUENCE {
    handoverNumber                  [0] ISDN-AddressString          OPTIONAL,
    relocationNumberList            [1]  RelocationNumberList       OPTIONAL,
    an-APDU                         [2]  AccessNetworkSignalInfo    OPTIONAL,
    multicallBearerInfo             [3]  MulticallBearerInfo        OPTIONAL,
    multipleBearerNotSupported      NULL                            OPTIONAL,
    extensionContainer              [4]  ExtensionContainer         OPTIONAL,
    ...}

PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
    targetCellId                    [0] GlobalCellId,
    targetMSC-Number                [1] ISDN-AddressString,
    targetRNCId                     [2] RNCId                       OPTIONAL,
    an-APDU                         [3]  AccessNetworkSignalInfo    OPTIONAL,
    selectedRab-Id                  [4]  RAB-Id                     OPTIONAL,
    extensionContainer              [5]  ExtensionContainer         OPTIONAL,
    ...}
```

```
PrepareSubsequentHO-Res ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
ProcessAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
SendEndSignal-Arg ::= [3] SEQUENCE {
    an-APDU                          AccessNetworkSignalInfo,
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
SendEndSignal-Res ::= SEQUENCE {
    extensionContainer               [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
RNCId ::= OCTET STRING (SIZE (75))
    -- Refers to the Target RNC-ID in the Target ID in 3G TS 25.413, where the encoding is
    -- defined.
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321             Mobile Country Code 1st digit
    --          bits 8765             Mobile Country Code 2nd digit
    -- octet 2 bits 4321             Mobile Country Code 3rd digit
    --          bits 8765             Mobile Network Code 3rd digit
    --                                or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321             Mobile Network Code 1st digit
    --          bits 8765             Mobile Network Code 2nd digit
    -- octets 4 and 5                RNC ID
```

```
RelocationNumberList ::= SEQUENCE SIZE (1..maxNumOfRelocationNumber) OF
                                      RelocationNumber
```

```
MulticallBearerInfo ::= INTEGER (1..maxNumOfRelocationNumber)
```

```
RelocationNumber ::= SEQUENCE {
    handoverNumber                   ISDN-AddressString,
    rab-Id                           RAB-Id,
    -- RAB Identity is needed to relate the calls with the radio access bearers.
    ...}
```

```
RAB-Id ::= INTEGER (1..maxNrOfRABs)
```

```
maxNrOfRABs INTEGER ::= 256
```

```
maxNumOfRelocationNumber  INTEGER ::= 7
```

```
RadioResourceInformation ::= OCTET STRING (SIZE (5..10))
    -- Octets are coded according the Channel Type information element in GSM 08.08
```

```
IntegrityProtectionInformation ::= OCTET STRING (SIZE (17..maxNumOfIntegrityInfo))
    -- Octets are coded according to 3G TS 25.413
```

```
maxNumOfIntegrityInfo INTEGER ::= 100
```

```
EncryptionInformation ::= OCTET STRING (SIZE (17..maxNumOfEncryptionInfo))
    -- Octets are coded according to 3G TS 25.413
```

```
maxNumOfEncryptionInfo INTEGER ::= 100
```

```
-- authentication management types
```

…

3GPP TSG CN4 Meeting #5
Paris, 13th November - 17th November 2000

Document N4-001079

CHANGE REQUEST

29.002	CR	209	Current Version:	3.6.0

For submission to: CN#10 | for approval [X] | for information [ ] | strategic [X] | 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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: CN4 **Date:** 16th November 2000

Subject: Transport of long RANAP messages on MAP-E interface

Work item: Handover

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:

Critical correction.

For signalling over the MAP E-interface to support inter-MSC handover/relocation White Book SCCP has to be supported.

The reference for the internal structure of the AccessNetworkSignalInfo data type is incorrect.

In order to make use of this capability the maximum size of the envelope which can be used to carry RANAP signalling encapsulated in MAP messages has to be increased.

Clauses affected: 6.1, 17.7.8

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	R00 29.002-212
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:

First Modified Section

6 Requirements concerning the use of SCCP and TC

6.1 Use of SCCP

The Mobile Application Part (MAP) makes use of the services offered by the Signalling Connection Control Part (SCCP).

MAP supports the following SCCP versions:

- Signalling Connection Control Part , Signalling System no. 7 CCITT ('Blue Book SCCP').
- Signalling Connection Control Part, Signalling System no. 7 ITU-T Recommendation (07/96) Q.711 to Q.716 ('White Book SCCP'). Support of White Book SCCP at the receiving side shall be mandated from 00:01hrs, 1st July 2002(UTC). However, for signalling over the MAP E-interface to support inter-MSC handover/relocation, the support of White Book SCCP shall be mandated with immediate effect.

A White Book SCCP message will fail if any signalling point used in the transfer of the message does not support White Book SCCP. Therefore it is recommended that the originator of the White Book SCCP message supports a drop back mechanism or route capability determination mechanism to interwork with signalling points that are beyond the control of GSM/UMTS network operators.

In North America (World Zone 1) the national version of SCCP is used as specified in ANSI T1.112. Interworking between a PLMN in North America and a PLMN outside North America will involve an STP to translate between ANSI SCCP and ITU-T/CCITT SCCP.

6.1.1 SCCP Class

Next Modified Section

17.7.8 Common data types

…….

```
SignalInfo ::= OCTET STRING (SIZE (1..maxSignalInfoLength))
```

```
maxSignalInfoLength  INTEGER ::= 200
     -- This NamedValue represents the theoretical maximum number of octets which is
     -- octets which are available to carry a single instance of the SignalInfo data type,
     -- without requiring segmentation to cope with the network layer service.
     -- service. However, the actual maximum size available for an instance of the data
     -- type may be lower, especially when other information elements
     -- have to be included in the same component.
```

…….

```
AccessNetworkSignalInfo ::= SEQUENCE {
     accessNetworkProtocolId             AccessNetworkProtocolId,
     signalInfo                          LongSignalInfo,
     -- Information about the internal structure is given in subclause 7.6.9.1
     -- subclause 7.6.9.4
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
LongSignalInfo ::= OCTET STRING (SIZE (1..maxLongSignalInfoLength))
```

```
maxLongSignalInfoLength  INTEGER ::= 2560
     -- This Named Value represents the maximum number of octets which is available
     -- to carry a single instance of the LongSignalInfo data type using
     -- White Book SCCP with the maximum number of segments.
     -- It takes account of the octets used by the lower layers of the protocol, and
     -- other information elements which may be included in the same component.
```

……..

[CR editor's note: this upper bound is subject to check before the CR is presented for approval by TSG-CN]

3GPP TSG CN4 Meeting #5
Paris, 13th November - 17th November 2000

Document N4-001095

CHANGE REQUEST

29.002	CR	212	Current Version:	4.1.0

For submission to: CN#10 — for approval [X] — for information [ ] — strategic [X] — 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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: CN4 **Date:** 16th November 2000

Subject: Transport of long RANAP messages on MAP-E interface

Work item: Handover

Category:

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

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[ ]
Release 00	[X]

Reason for change:

For signalling over the MAP E-interface to support inter-MSC handover/relocation White Book SCCP has to be supported.

The reference for the internal structure of the AccessNetworkSignalInfo data type is incorrect.

In order to make use of this capability the maximum size of the envelope which can be used to carry RANAP signalling encapsulated in MAP messages has to be increased.

Clauses affected: 6.1, 17.7.8

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	R99 CR 29.002-209
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:

First Modified Section

6 Requirements concerning the use of SCCP and TC

6.1 Use of SCCP

The Mobile Application Part (MAP) makes use of the services offered by the Signalling Connection Control Part (SCCP).

MAP supports the following SCCP versions:

- Signalling Connection Control Part , Signalling System no. 7 CCITT ('Blue Book SCCP').
- Signalling Connection Control Part, Signalling System no. 7 ITU-T Recommendation (07/96) Q.711 to Q.716 ('White Book SCCP'). Support of White Book SCCP at the receiving side shall be mandated from 00:01hrs, 1st July 2002(UTC). However, for signalling over the MAP E-interface to support inter-MSC handover/relocation, the support of White Book SCCP shall be mandated with immediate effect.

A White Book SCCP message will fail if any signalling point used in the transfer of the message does not support White Book SCCP. Therefore it is recommended that the originator of the White Book SCCP message supports a drop back mechanism or route capability determination mechanism to interwork with signalling points that are beyond the control of GSM/UMTS network operators.

In North America (World Zone 1) the national version of SCCP is used as specified in ANSI T1.112. Interworking between a PLMN in North America and a PLMN outside North America will involve an STP to translate between ANSI SCCP and ITU-T/CCITT SCCP.

6.1.1 SCCP Class

Next Modified Section

17.7.8 Common data types

…….

```
SignalInfo ::= OCTET STRING (SIZE (1..maxSignalInfoLength))
```

```
maxSignalInfoLength  INTEGER ::= 200
     -- This NamedValue represents the theoretical maximum number of octets which is
     -- octets which are available to carry a single instance of the SignalInfo data type,
     -- without requiring segmentation to cope with the network layer service.
     -- service. However, the actual maximum size available for an instance of the data
     -- type may be lower, especially when other information elements
     -- have to be included in the same component.
```

…….

```
AccessNetworkSignalInfo ::= SEQUENCE {
     accessNetworkProtocolId             AccessNetworkProtocolId,
     signalInfo                          LongSignalInfo,
     -- Information about the internal structure is given in subclause 7.6.9.1
     -- subclause 7.6.9.4
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
LongSignalInfo ::= OCTET STRING (SIZE (1..maxLongSignalInfoLength))
```

```
maxLongSignalInfoLength  INTEGER ::= 2560
     -- This Named Value represents the maximum number of octets which is available
     -- to carry a single instance of the LongSignalInfo data type using
     -- White Book SCCP with the maximum number of segments.
     -- It takes account of the octets used by the lower layers of the protocol, and
     -- other information elements which may be included in the same component.
```

……..

[CR editor's note: this upper bound is subject to check before the CR is presented for approval by TSG-CN]

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

Document N4-000915
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

29.010	CR	008	Current Version:	3.3.0

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-10-27

Subject: GSM to 3G Handover: Location Reporting in 3G_MSC-B

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:

Critical CR.

3G_MSC-B or 3G_MSC-B' should always initiate the Location Reporting Control procedure towards the target RNC since the MAP-E interface does not support initiation of the Location Reporting Control procedure from MSC-A in case of GSM to UMTS handover. If no reporting control is required from the target RNC, after an inter-MSC GSM to UMTS handover, neither legal interception nor location based services running in the anchor MSC will work, due to that the RNC does not inform of location changes.

Clauses affected: 4.7.1, 4.7.3, 4.7.4 (new subchapter 4.7.4.3)

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	23.009 CR015
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:

help.doc

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

First Modified Section

4.7.1 Basic Inter-MSC Handover

When a Mobile Station is handed over between two MSCs, the establishment of a connection between them (described in 3G TS 23.009) requires interworking between A-Interface, Iu-Interface and E-Interface.

The signalling at initiation, execution and completion of the Basic Inter-MSC handover procedure is shown in figures 37 to 42 with both possible positive or negative outcomes.

Additionally figure 37b shows the possible interworking when the trace related message is transparently transferred on the E-Interface at Basic Inter-MSC Handover initiation.

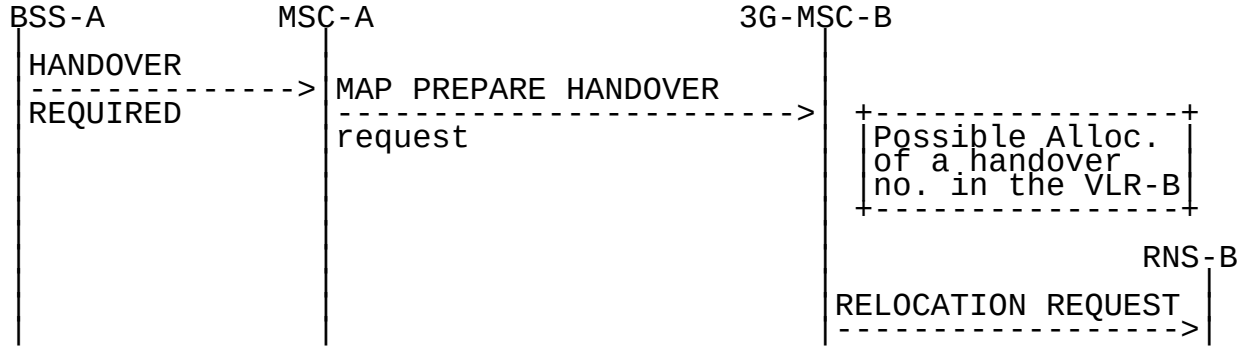


Figure 37a: Signalling for Basic Inter-MSC Handover initiation (no trace related messages transferred)

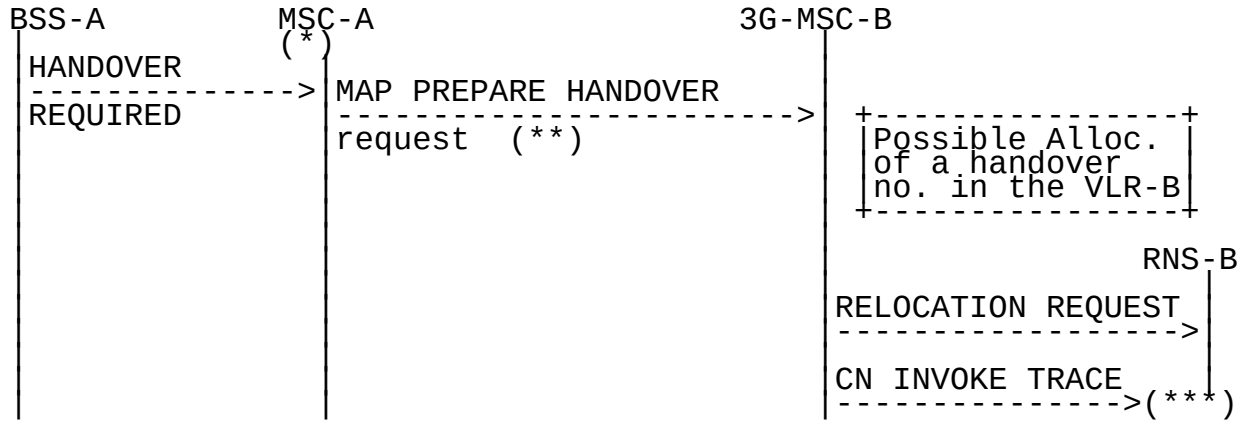


Figure 37b: Signalling for Basic Inter-MSC Handover initiation (CN invoke trace message transferred)

(*): Tracing invocation has been received from VLR.

(**): In that case, HANDOVER REQUEST and MSC INVOKE TRACE messages are included within the AN-apdu parameter.

(***): CN INVOKE TRACE is forwarded to RNS-B if supported by 3G_MSC-B.

Possible Positive outcomes: successful radio resources allocation and handover number allocation (if performed):

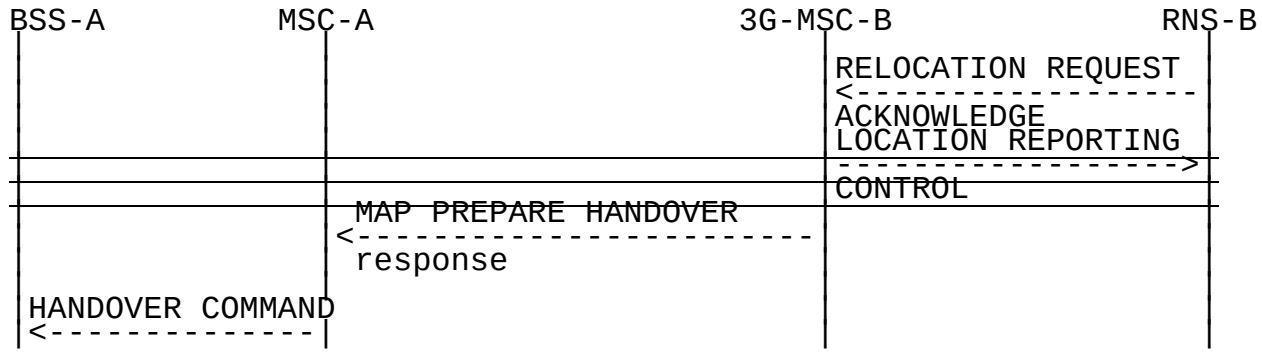
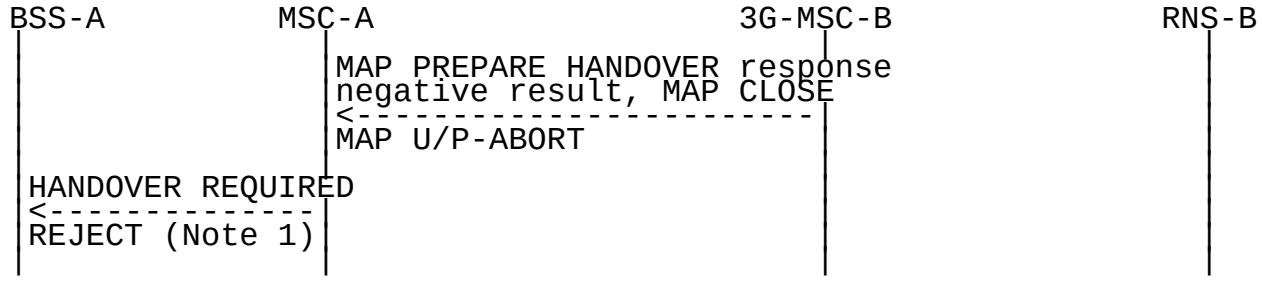


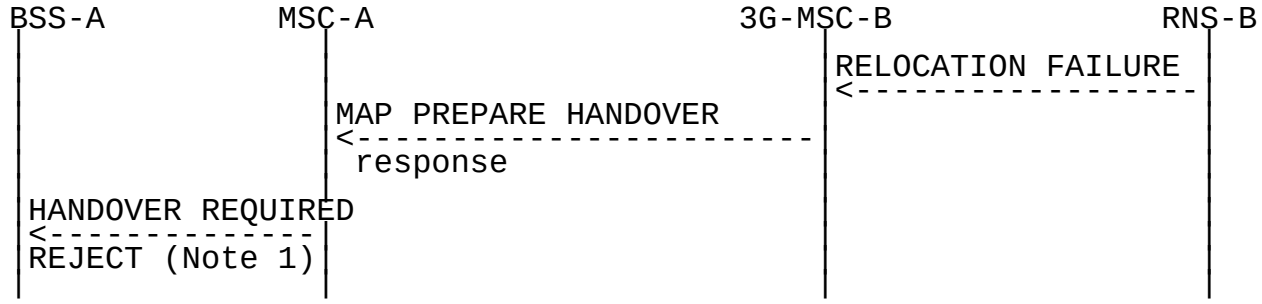
Figure 38: Signalling for Basic Inter-MSC Handover execution (Positive outcome)

Possible Negative outcomes:

a) user error detected, or handover number allocation unsuccessful (if performed), or component rejection or dialogue abortion performed by 3G_MSC-B:



b) radio resources allocation failure:



c) unsuccessful handover execution (Reversion to the old radio resources):

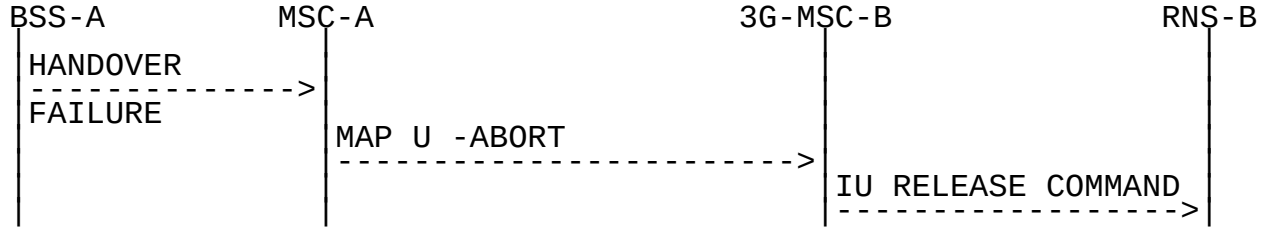


Figure 39: Signalling for Basic Inter-MSC Handover execution (Negative outcomes)

NOTE: Possible rejection of the handover because of the negative outcome of MAP or RANAP procedure.

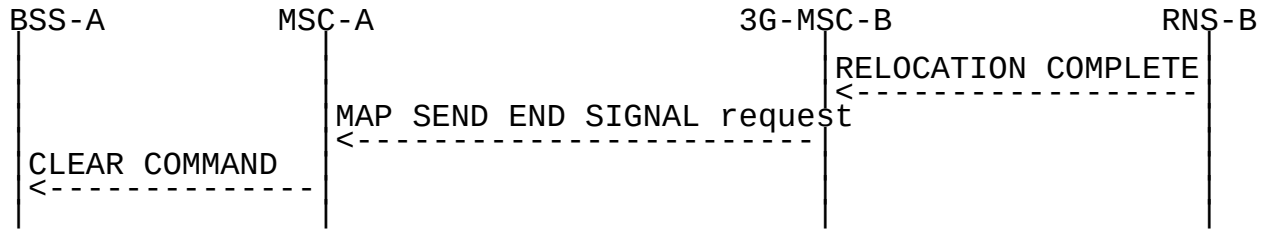


Figure 40: Signalling for Basic Inter-MSC Handover completion

Positive outcome:

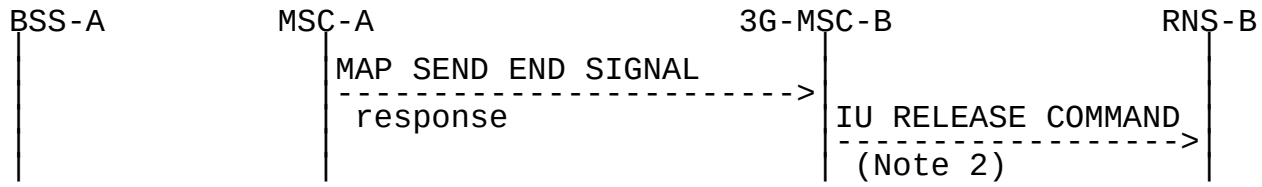


Figure 41: Signalling for Basic Inter-MSC Handover completion (Positive outcome)

Negative outcome:

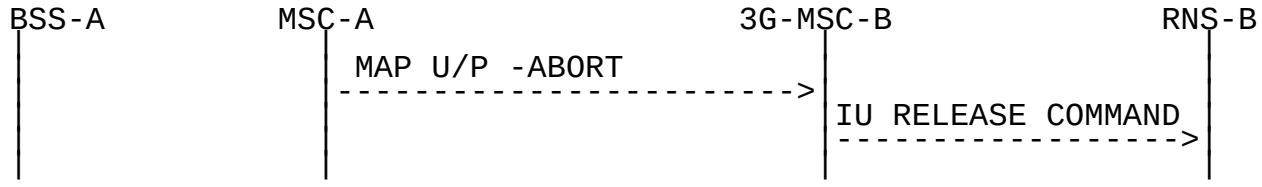


Figure 42: Signalling for Basic Inter-MSC Handover completion (Negative outcome)

NOTE: From interworking between MAP and RANAP point of view, when the call is released.

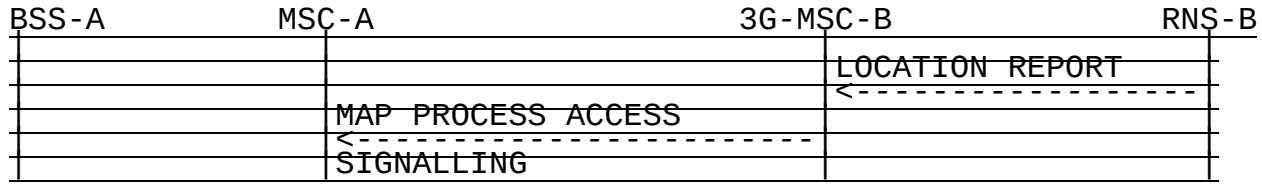


Figure xx: Signalling for updating of anchor MSC after change of location in RNS

The handover procedure is normally triggered by BSS-A by sending a HANDOVER REQUIRED message on A-Interface to MSC-A. The invocation of the Basic Inter-MSC handover procedure is performed and controlled by MSC-A. The sending of the MAP Prepare-Handover request to 3G_MSC-B is triggered in MSC-A upon receipt of the HANDOVER REQUIRED message. For compatibility reason, the cell identity of the cell where the call is to be handed over in 3G_MSC-B area, provided in the HANDOVER REQUIRED message, is mapped into targetCellId MAP parameter and the HANDOVER REQUEST message is encapsulated in the an-APDU MAP parameter of the Prepare-Handover MAP request. 3G_MSC-B can invoke another operation towards the VLR-B (allocation of the handover number described in 3G TS 29.002).

Additionally, if tracing activity has been invoked, the trace related message can be transferred on the E-Interface encapsulated in the an-APDU MAP parameter of the Prepare-Handover Request. If transferred, one complete trace related message at a time shall be included in the an-APDU MAP parameter after the HANDOVER REQUEST message. Note: UMTS supports only CN initiated tracing.

The interworking between Prepare Handover and HANDOVER REQUIRED is as follows:

	08.08	29.002	Notes
Forward message	HANDOVER REQUIRED BSSMAP information elements	MAP PREPARE HANDOVER request -ho-NumberNotRequired -targetCellId -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	1 2 3
Positive result		MAP PREPARE HANDOVER response -handover number -an-APDU(HANDOVER REQUEST ACKNOWLEDGE or HANDOVER FAILURE)	4
Negative result	HANDOVER REQUIRED REJECT equipment failure equipment failure equipment failure equipment failure equipment failure equipment failure	MAP PREPARE HANDOVER System Failure No Handover Number available UnexpectedDataValue Data Missing MAP CLOSE MAP U/P -ABORT	5

NOTE 1: The ho-NumberNotRequired parameter is included by MSC-A, when MSC-A decides not to use any circuit connection with 3G_MSC-B. No handover number shall be present in the positive result. Any negative response from 3G_MSC-B shall not be due to handover number allocation problem.

NOTE 2: The process performed on the BSSMAP information elements received in the HANDOVER REQUIRED message is described in the GSM Recommendation 08.08.

NOTE 3: The process performed on the BSSMAP information elements received in the MSC INVOKE TRACE message is described in subclause 4.5.5.6.

NOTE 4: The response to the Prepare-Handover request can include in its an-APDU parameter, identifying the GSM 08.06 protocol, either a BSSMAP HANDOVER REQUEST ACKNOWLEDGE or a BSSMAP HANDOVER FAILURE.

In the first case, the positive result triggers in MSC-A the sending on A-Interface of the HANDOVER COMMAND.

In the second case, the positive result triggers in MSC-A optionally the sending of the HANDOVER REQUIRED REJECT.

(The possible sending of the HANDOVER REQUIRED REJECT message upon receipt of the HANDOVER FAILURE is out of the scope of 3G TS 29.010 and lies in GSM 08.08).

NOTE 5: The possible sending of the HANDOVER REQUIRED REJECT message is described in GSM 08.08.

The interworking between Prepare Handover and RELOCATION REQUEST in 3G_MSC-B is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -ho-NumberNotRequired -targetCellId -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	RELOCATION REQUEST	
	BSSMAP information elements: Channel Type Cause sRNC to tRNC container	RANAP information elements: RAB parameters Cause sRNC to tRNC container info stored/generated in/by 3G_MSC-B: CN domain indicator	
Positive result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER REQUEST ACK)	RELOCATION REQUEST ACK	
	BSSMAP information elements: Layer 3 info	RANAP information elements: tRNC to sRNC container	
Negative result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER FAILURE)	RELOCATION FAILURE	

The interworking between Send End Signal and RELOCATION COMPLETE in 3G_MSC-B is as follows:

	25.413	29.002	Notes
Forward message	RELOCATION COMPLETE	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	
Positive result	IU RELEASE COMMAND -Normal release	MAP SEND END SIGNAL response	1
Negative result	IU RELEASE COMMAND -Normal release -Normal release	MAP CLOSE MAP U/P -ABORT	2

NOTE 1: The positive empty result triggers the clearing of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B. If a circuit connection is used between MSC-A and 3G_MSC-B, the 'Normal release' clearing cause shall only be given to RNS-B when 3G_MSC-B has received a clearing indication on its circuit connection with MSC-A.

NOTE 2: The abortion of the dialogue or the rejection of the component triggers in 3G_MSC-B the clearing of its circuit connection with MSC-A, if any, of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B.

The interworking between Send End Signal and CLEAR COMMAND in MSC-A is as follows:

	29.002	08.08	Notes
Forward message	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	CLEAR COMMAND - Handover Successful	
Positive result			
Negative result			

The interworking between HANDOVER FAILURE in case of reversion to old channel of the MS and User Abort in MSC-A is as follows:

	08.08	29.002	Notes
Forward message	HANDOVER FAILURE - Reversion to old channel	MAP U -ABORT	
Positive result			
Negative result			

Next Modified Section

4.7.3 Subsequent Inter-MSC Handover to third MSC

When a Mobile Station is being handed over to a third MSC, the procedure (described in 3G TS 23.009) does require one specific interworking case in MSC-A (figure 49) between E-Interface from MSC-B and E-Interface from 3G_MSC-B' other than the combination of the ones described in the subclause 4.5.1 and 4.7.2.

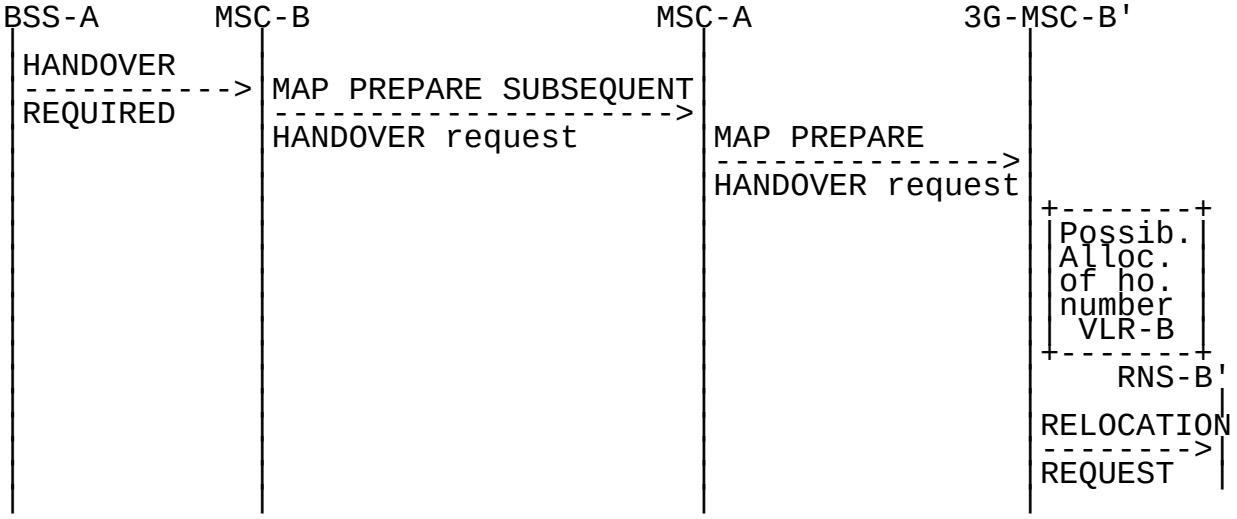


Figure 45: Signalling for Subsequent Inter-MSC Handover to third MSC (3G_MSC-B') initiation

Possible Positive outcomes: successful radio resources allocation:

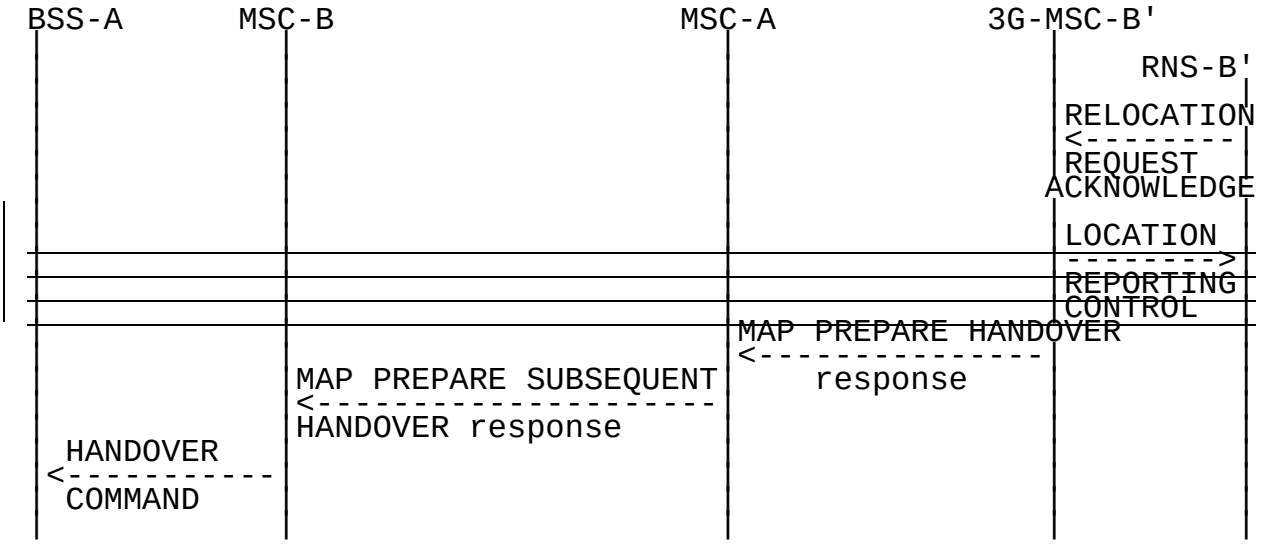
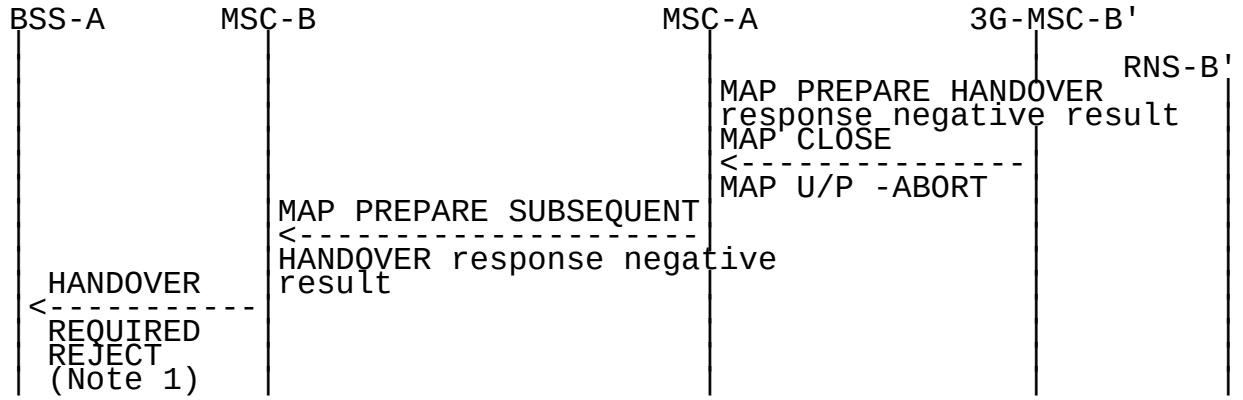


Figure 46: Signalling for Subsequent Inter-MSC Handover to third MSC (3G_MSC-B') execution (Positive outcome)

Possible Negative outcomes:

a) user error detected, or component rejection or dialogue abortion performed by MSC-B':



b) radio resources allocation failure:

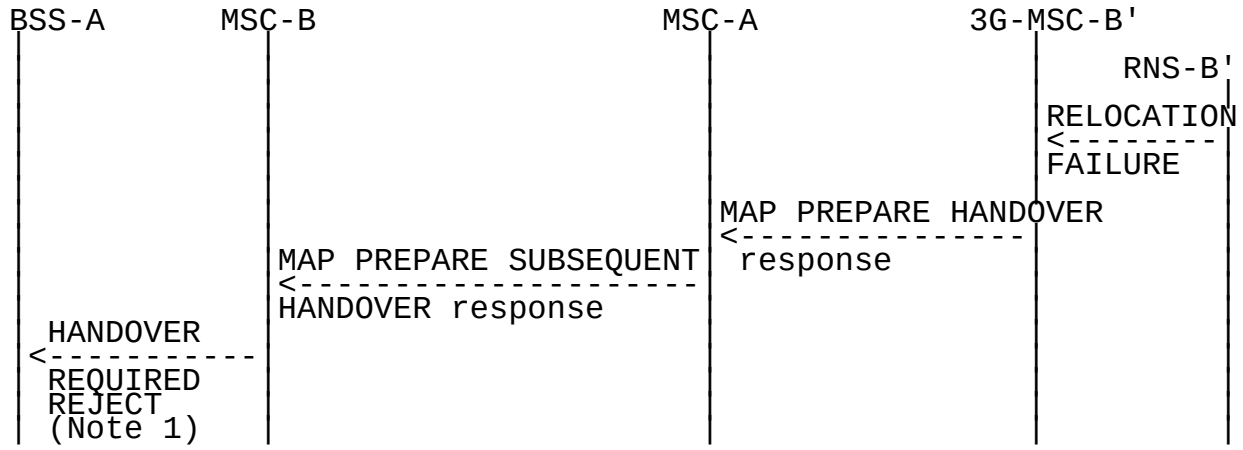


Figure 47: Signalling for Subsequent Inter-MSC Handover to third MSC (3G_MSC-B') execution (Negative outcome)

NOTE 1: Possible rejection of the handover because of the negative outcome of MAP or BSSMAP procedure.

Positive outcome:

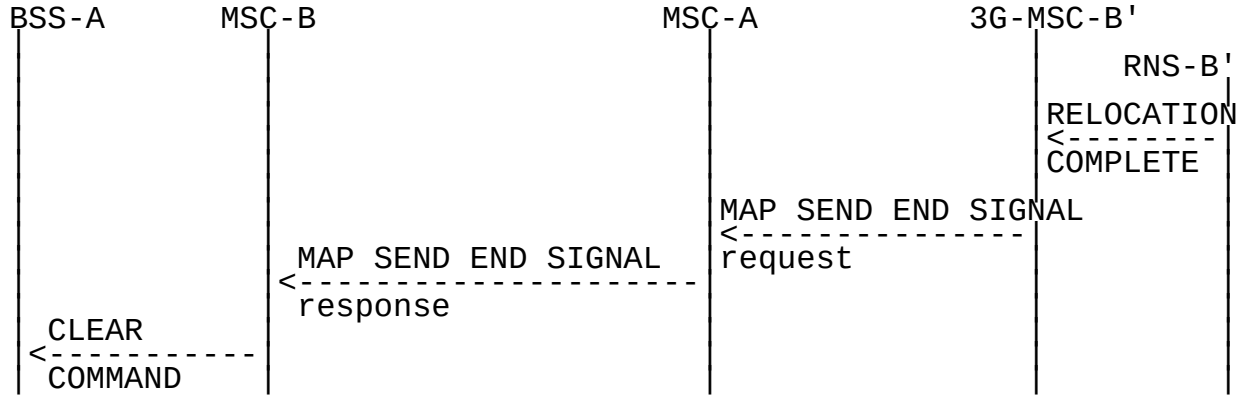


Figure 48: Signalling for Subsequent Inter-MSC Handover to third MSC (3G_MSC-B') completion (Successful completion of the procedure)

Negative outcome:

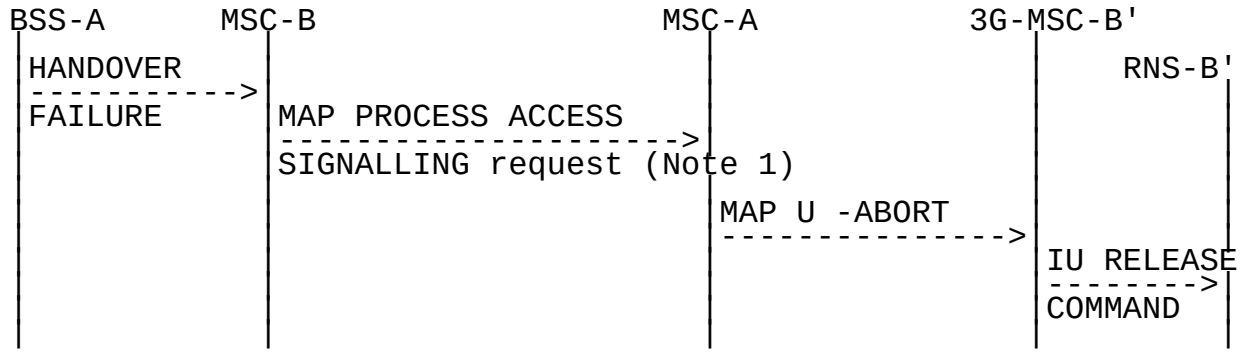


Figure 49: Signalling for Subsequent Inter-MSC Handover to third MSC (3G_MSC-B') completion (Unsuccessful completion of the procedure)

NOTE: Specific interworking case detailed below.

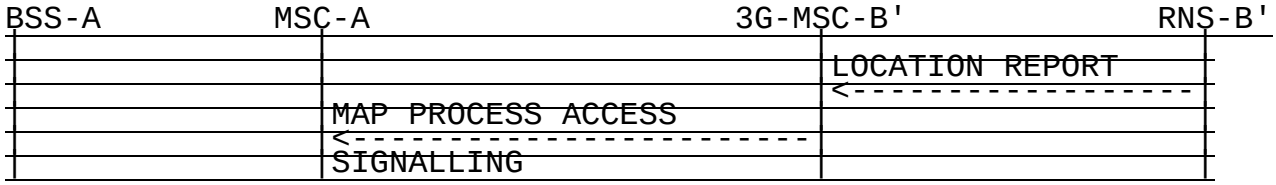


Figure yy: Signalling for updating of anchor MSC after change of location in RNS

The specific interworking case in MSC-A compared to the subclauses 4.5.1 and 4.7.2 occurs between HANDOVER FAILURE encapsulated in a Process Access Signalling from MSC-B and the abortion of the dialogue with 3G_MSC-B' in the case of a reversion to old channel of the MS:

	29.002	29.002	Notes
Forward message	MAP PROCESS-SIGNALLING request -an-APDU(HANDOVER FAILURE)	MAP U -ABORT	1
Positive result			
Negative result		MAP U/P -ABORT	2

NOTE 1: The abortion of the dialogue triggers in 3G_MSC-B' the clearing of the circuit connection with MSC-A, if any, and of the Resources between 3G_MSC-B' and RNS-B'. The abortion of the dialogue ends the handover procedure with 3G_MSC-B'.

NOTE 2: The abortion of the dialogue ends the handover procedure with MSC-B.

Next Modified Section

4.7.4 BSSAP Messages transfer on E-Interface

The handling is described in chapter 4.5.4, additional cases are described in this chapter.

~~NOTE: Handling of (RANAP) Location reporting control is FFS.~~

4.7.4.1 Assignment

The interworking between the BSSMAP assignment messages in MAP and the RANAP RAB assignment messages is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT REQUEST)	RAB ASSIGNMENT REQ	
	BSSMAP information elements:	RANAP information elements:	
	Channel Type	RAB parameters	
Positive result	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT COMPLETE	RAB ASSIGNMENT RESPONSE (positive result)	
	or ASSIGNMENT FAILURE)	RAB ASSIGNMENT RESPONSE (negative result)	
	BSSMAP information elements:	RANAP information elements:	
	Cause	Cause	1
Negative result		MAP U/P –ABORT	

NOTE: The mapping of the cause codes between BSSMAP and RANAP is for further study.

4.7.4.2 Cipher Mode Control

The interworking between the BSSMAP cipher mode messages in MAP and the RANAP security mode messages is as follows:

	29.002	25.413	Notes
Forward message	MAP FORWARD ACCESS SIGN. request -an-APDU(CIPHER MODE CMD)	SECURITY MODE CMD	
	BSSMAP information elements:	RANAP information elements:	
	Encryption information	Integrity protection info Encryption info	
Positive result	MAP PROCESS ACCESS SIGN. request -an-APDU(		
	CIPHER MODE COMPLETE or	SECURITY MODE COMPLETE	
	CIPHER MODE REJECT)	SECURITY MODE REJECT	
	BSSMAP information elements:	RANAP information elements:	
	Encryption information	Integrity protection info Encryption info	
	Cause	Cause	1
Negative result		MAP U/P –ABORT	

NOTE: The mapping of the cause codes between BSSMAP and RANAP is for further study.

New Section

4.7.4.3 Location Reporting Control

The interworking between the RANAP location report message and the BSSMAP handover performed message in MAP is as follows:

	25.413	29.002	Notes
Forward message	LOCATION REPORT	MAP PROC. ACC. SIGNALLING -an-APDU(HANDOVER PERFORMED)	
	RANAP information elements:	BSSMAP information elements:	
	Area identity (SAI) Cause	Cell identifier Cause	
Positive result			
Negative result			

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

Document N4-000916
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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29.010	**CR**	**009**	Current Version:	3.3.0

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

For submission to:	CN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-13

Subject: GSM to 3G Handover: Chosen IEs in Handover Request Ack

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:

Non-critical CR supported by consensus in the meeting.

In case of inter-system handover from GSM to UMTS, MSC-A may include more than one permitted value in Channel Type in Handover Request transferred in MAP_PREPARE_HANDOVER Request. MSC-B may need these permitted values in case of intra MSC inter-system handover from UMTS to GSM.
Handover Request Ack transferred in MAP_PREPARE_HANDOVER Response should not include Chosen Channel and Speech Version (Chosen) in case of inter-system handover from GSM to UMTS since the existing chosen values are not applicable for UMTS access. This is in alignment with the handling of Encryption Information described in clause 4.7.5.1

Clauses affected: 4.7.5.2

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:

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

First Modified Section

4.7.5 Processing in 3G_MSC-B, and information transfer on E-interface

The following parameters require processing (e.g. to store the parameter, to internally generate the parameter) in MSC-B. The relevant BSSMAP procedures are mentioned to ease the comprehension, their detailed description is the scope of GSM 08.08. Each BSSMAP message listed in GSM 09.08 being transferred on E-interface shall use the mechanisms given in subclause 4.5.4 and is described in GSM 08.08.

4.7.5.1 Encryption Information

The list of GSM algorithms, the ciphering key and the chosen algorithm shall be stored by 3G_MSC-B and used for generating the UMTS parameters Encryption Information and Integrity Protection Information if they are not received in MAP Prepare Handover Request (the generation of the UMTS parameters from the GSM parameters is described in TS 33.102).

Transfer of Information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by MSC-A after the completion of Inter-MSC Handover.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Handover:

- in the Handover Request BSSMAP message (information included).

  The Handover Request Acknowledge should in this case NOT contain the indication of the chosen algorithm.

If Ciphering has NOT been performed before Inter-MSC Handover:

- in the Cipher Mode Command procedure between MSC-A and 3G_MSC-B.

4.7.5.2 Channel Type

The Channel Type shall be stored by 3G_MSC-B and used for generating RAB parameters.

Transfer of Information:

Independently of the type of resource (Signalling only or traffic channel) assigned to the MS, the Channel Type Information is transferred to 3G_MSC-B in:

- the Handover Request BSSMAP message.

  Chosen Channel and/or Speech Version shall NOT be reported back to MSC-A in the Handover Request Acknowledge

If a new type of resource is to be assigned after Inter-MSC Handover, this can be made with:

- the BSSMAP Assignment procedure between MSC-A and 3G_MSC-B.

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29.010	CR	010	Current Version:	3.3.0

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	strategic		*(for SMG use only)*
	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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

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

Subject: GSM to 3G Handover: MAP parameter Target Cell ID

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:

Non-critical CR supported by consensus in the meeting.

The MAP parameter Target Cell ID in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER is not applicable in case of inter-system handover GSM to UMTS. Target RNC ID is included in the IE Cell Identifier (Target) in the BSSAP message Handover Request and there is no need to send it also as a MAP parameter.
It is proposed that neither the MAP parameter Target Cell Id nor the Target RNC Id shall be included in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER in case of inter-system handover GSM to UMTS.

Clauses affected: 4.7.1, 4.7.2

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	23.009 CR014, 29.002 CR195
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:

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

First Modified Section

4.7 Inter-MSC Handover (GSM to UMTS)

The general principles of the handover procedures are given in 3G TS 23.009. 3G TS 29.010 gives the necessary information for interworking between the 3G TS 25.413 RANAP protocol, GSM handover procedures and the 3G TS 29.002 MAP protocol. The RANAP protocol is used between the RNS and the 3G_MSC.

The following four principles apply for the Inter-MSC handover GSM to UMTS:

The BSSMAP parameters required for Inter-MSC handover GSM to UMTS are generated as in GSM.

Received RANAP parameters, e.g. cause code or transparent container, are mapped to the appropriate BSSMAP parameters, e.g. cause code or Handover command.

The RANAP parameters required for Inter-MSC handover GSM to UMTS are generated from received or stored GSM parameters.

4.7.1 Basic Inter-MSC Handover

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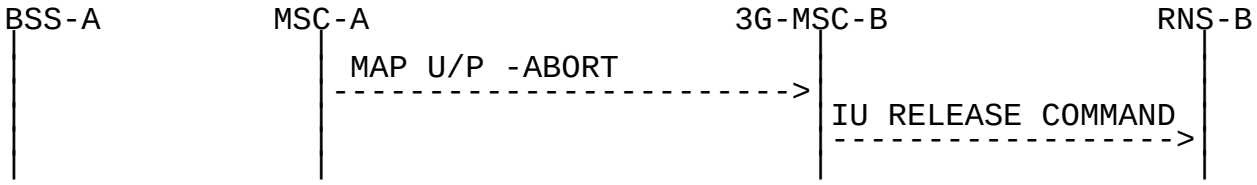

Figure 42: Signalling for Basic Inter-MSC Handover completion (Negative outcome)

NOTE 2: From interworking between MAP and RANAP point of view, when the call is released.

The handover procedure is normally triggered by BSS-A by sending a HANDOVER REQUIRED message on A-Interface to MSC-A. The invocation of the Basic Inter-MSC handover procedure is performed and controlled by MSC-A. The sending of the MAP Prepare-Handover request to 3G_MSC-B is triggered in MSC-A upon receipt of the HANDOVER REQUIRED message. ~~For compatibility reason, the cell identity of the cell where the call is to be handed over in 3G_MSC-B area, provided in the HANDOVER REQUIRED message, is mapped into targetCellId MAP parameter and t~~The HANDOVER REQUEST message is encapsulated in the an-APDU MAP parameter of the Prepare-Handover MAP request. 3G_MSC-B can invoke another operation towards the VLR-B (allocation of the handover number described in 3GPP TS 29.002).

Additionally, if tracing activity has been invoked, the trace related message can be transferred on the E-Interface encapsulated in the an-APDU MAP parameter of the Prepare-Handover Request. If transferred, one complete trace related message at a time shall be included in the an-APDU MAP parameter after the HANDOVER REQUEST message. Note: UMTS supports only CN initiated tracing.

The interworking between Prepare Handover and HANDOVER REQUIRED is as follows:

	08.08	29.002	Notes
Forward message	HANDOVER REQUIRED BSSMAP information elements	MAP PREPARE HANDOVER request -ho-NumberNotRequired -targetCellId -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	1 2 3 4
Positive result		MAP PREPARE HANDOVER response -handover number -an-APDU(HANDOVER REQUEST ACKNOWLEDGE or HANDOVER FAILURE)	5
Negative result	HANDOVER REQUIRED REJECT equipment failure equipment failure equipment failure equipment failure equipment failure equipment failure	MAP PREPARE HANDOVER System Failure No Handover Number available UnexpectedDataValue Data Missing MAP CLOSE MAP U/P -ABORT	6

NOTE 1: The ho-NumberNotRequired parameter is included by MSC-A, when MSC-A decides not to use any circuit connection with 3G_MSC-B. No handover number shall be present in the positive result. Any negative response from 3G_MSC-B shall not be due to handover number allocation problem.

NOTE 2: Integrity protection information, encryption information and IMSI parameters are included by MSC-A, only when the MSC-A uses 29.002 as per release 99. These IEs are not included if the MSC-A is R98 or earlier.

NOTE 3: The process performed on the BSSMAP information elements received in the HANDOVER REQUIRED message is described in the GSM Recommendation 08.08.

NOTE 4: The process performed on the BSSMAP information elements received in the MSC INVOKE TRACE message is described in subclause 4.5.5.6.

NOTE 5: The response to the Prepare-Handover request can include in its an-APDU parameter, identifying the GSM 08.06 protocol, either a BSSMAP HANDOVER REQUEST ACKNOWLEDGE or a BSSMAP HANDOVER FAILURE.

In the first case, the positive result triggers in MSC-A the sending on A-Interface of the HANDOVER COMMAND.

In the second case, the positive result triggers in MSC-A optionally the sending of the HANDOVER REQUIRED REJECT.

(The possible sending of the HANDOVER REQUIRED REJECT message upon receipt of the HANDOVER FAILURE is out of the scope of 3GPP TS 29.010 and lies in GSM 08.08).

NOTE 6: The possible sending of the HANDOVER REQUIRED REJECT message is described in GSM 08.08.

The interworking between Prepare Handover and RELOCATION REQUEST in 3G_MSC-B is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -ho-NumberNotRequired -targetCellId -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	RELOCATION REQUEST	1
	BSSMAP information elements: Channel Type Cause sRNC to tRNC container	RANAP information elements: RAB parameters Cause sRNC to tRNC container	
		info stored/generated in/by 3G_MSC-B: CN domain indicator	
Positive result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER REQUEST ACK)	RELOCATION REQUEST ACK	
	BSSMAP information elements: Layer 3 info	RANAP information elements: tRNC to sRNC container	
Negative result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER FAILURE)	RELOCATION FAILURE	

Next Modified Section

4.7.2 Basic Inter-MSC Handover

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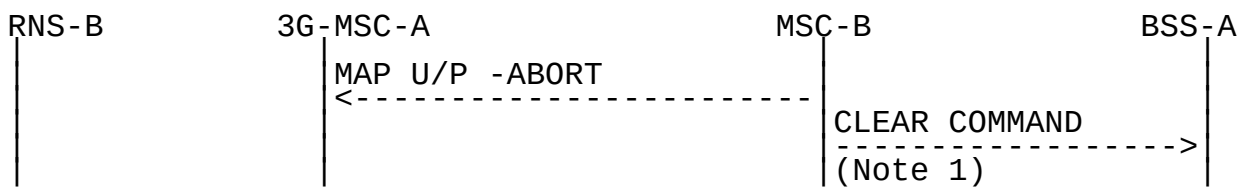

Figure 47: Signalling for Subsequent Inter-MSC Handover back to 3G_MSC-A completion (Unsuccessful completion of the procedure)

NOTE 1: Abnormal end of the procedure that triggers the clearing of all resources in MSC-B.

The interworking between Prepare Subsequent Handover and HANDOVER REQUIRED is as follows:

	08.08	29.002	Notes
Forward message	HANDOVER REQUIRED BSSMAP information elements	MAP PREPARE SUBSEQUENT HANDOVER request -target MSC number -targetCellId -an-APDU(HANDOVER REQUEST)	1
Positive result	HANDOVER REQUIRED	MAP PREPARE SUBSEQUENT HANDOVER response -an-APDU(HANDOVER REQUEST ACKNOWLEDGE or HANDOVER FAILURE)	2
Negative result	HANDOVER REQUIRED REJECT equipment failure equipment failure equipment failure equipment failure CLEAR COMMAND equipment failure equipment failure	MAP PREPARE SUBSEQUENT HANDOVER response Unknown MSC Subsequent Handover Failure UnexpectedDataValue Data Missing MAP CLOSE MAP U/P -ABORT	3

NOTE 1: The processing performed on the BSSMAP information elements received in the HANDOVER REQUIRED message is out of the scope of the present document. The target MSC number is provided to 3G_MSC-A by MSC-B based on the information received from RNS-B.

NOTE 2: The response to the Prepare-Subsequent-Handover request can include in its an-APDU parameter, identifying the GSM 08.06 protocol, either a BSSMAP HANDOVER REQUEST ACKNOWLEDGE or a BSSMAP HANDOVER FAILURE.

In the first case, the positive result triggers in MSC-B the sending on A-Interface of the HANDOVER COMMAND.

In the second case, the positive result triggers in MSC-B optionally the sending of the HANDOVER REQUIRED REJECT.

(The possible sending of the HANDOVER REQUIRED REJECT message upon receipt of the HANDOVER FAILURE is out of the scope of 3GPP TS 29.010 and lies in GSM 08.08).

NOTE 3: The possible sending of the HANDOVER REQUIRED REJECT message is described in GSM 08.08.

The interworking between Prepare Subsequent Handover and RELOCATION REQUEST in 3G_MSC-A is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE SUB HANDOVER request -ho-NumberNotRequired -targetCellId -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE) BSSMAP information elements: Cause sRNC to tRNC container	RELOCATION REQUEST RANAP information elements: Cause sRNC to tRNC container info stored/generated in/by 3G_MSC-A: CN domain indicator RAB parameters Permanent NAS UE id Encryption info Integrity protection info	
Positive result	MAP PREPARE SUB HANDOVER response -an-APDU(HANDOVER REQUEST ACK) BSSMAP information elements: Layer 3 info	RELOCATION REQUEST ACK RANAP information elements: tRNC to sRNC container	
Negative result	MAP SUB PREPARE HANDOVER response -an-APDU(HANDOVER FAILURE)	RELOCATION FAILURE	

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CHANGE REQUEST

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29.010	CR	011r1	Current Version:	3.3.0

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

For submission to:	CN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: CN4 **Date:** 2000-11-14

Subject: GSM/UMTS Interworking: Mapping of cause codes

Work item: Handover

Category: *(only one category shall be marked with an X)*

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:
Non-critical CR supported by consensus in the meeting.

Cause code mapping between BSSMAP and RANAP is missing. This mapping is needed when performing inter-system handover.

Clauses affected: 4.6.5 and 4.7.6 (new chapters). 1, 4.7.4.1, and 4.7.4.2 (modified chapters)

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:


help.doc

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

First Modified Section

1 Scope

The scope of the present document is:

i) to provide a detailed specification for the interworking between information elements contained in layer 3 messages sent on the MS-MSC interface (Call Control and Mobility Management parts of GSM 04.08) and parameters contained in MAP services sent over the MSC-VLR interface (GSM 09.02) where the MSC acts as a transparent relay of information;

ii) ~~ii)~~ to provide a detailed specification for the interworking between information elements contained in BSSMAP messages sent on the BSC-MSC interface (GSM 08.08) and parameters contained in MAP services sent over the MSC-VLR interface (GSM 09.02) where the MSC acts as a transparent relay of information;

iii) to provide a detailed specification for the interworking between information elements contained in BSSMAP messages (GSM 08.08) and RANAP (25.413)

iv) ~~iii)~~ to provide a detailed specification for the interworking as in i) and ii) above when the MSC also processes the information.

Interworking for supplementary services is given in GSM 09.11. Interworking for the short message service is given in GSM 03.40 and GSM 04.11. Interworking between the call control signalling of GSM 04.08 and the PSTN/ISDN is given in GSM 09.03, GSM 09.07 and GSM 09.08. Interworking between the 'A' and 'E' interfaces for inter-MSC handover signalling is given in GSM 09.07 and 09.08.

New Section

4.6.5 Cause Code Mapping

When a Mobile Station is handed over between UMTS and GSM, a mapping of the cause codes used in the RANAP and the BSSMAP protocols is needed. The mapping described here is applicable to the BSSMAP protocol even when used inside MAP in the E-interface.

The mapping between the cause codes received in RANAP Relocation Required and the cause codes sent in BSSMAP Handover Request is as follows:

25.413	08.08	Notes
~~RELOCATION REQUIRED~~	~~HANDOVER REQUEST~~	
-Time critical relocation	-Better cell	
-Resource optimisation relocation		1
-Relocation desirable for radio reasons	-Better cell	
-Any other value	-Better cell	

NOTE 1: Cause code not used at inter-system handover.

The mapping between the cause codes received in RANAP Relocation Cancel and the cause codes sent in BSSMAP Clear Command is as follows:

25.413	08.08	Notes
RELOCATION CANCEL	CLEAR COMMAND	
-Trelocprepexpiry	-Radio interface failure, reversion to old channel	
-Interaction with other procedure	-Radio interface failure, reversion to old channel	
-Any other value	-Radio interface failure, reversion to old channel	

The mapping between the cause codes received in BSSMAP Handover Failure and the cause codes sent in RANAP Relocation Preparation Failure is as follows:

08.08	25.413	Notes
HANDOVER FAILURE	RELOCATION PREP. FAILURE	
-Ciphering algorithm not supported	-Requested ciphering and/or integrity protection is not supported	
-Circuit pool mismatch		1
-Equipment failure	-Relocation failure in Target CN/RNC or target system	
-Invalid message contents	-Abstract Syntax Error	
-No radio resource available	-Relocation failure in Target CN/RNC or target system	
-O and M intervention	-O and M intervention	
-Radio interface failure, reversion to old channel		2
-Radio interface message failure	-Relocation failure in Target CN/RNC or target system	
-Requested speech version unavailable	-Relocation failure in Target CN/RNC or target system	
-Requested terrestrial resource unavailable	-Relocation failure in Target CN/RNC or target system	
-Requested transcoding/rate adaption unavailable	-Relocation failure in Target CN/RNC or target system	
-Switch circuit pool		1
-Terrestrial circuit already allocated	-Relocation failure in Target CN/RNC or target system	
-Any other value	-Relocation failure in Target CN/RNC or target system	

NOTE 1: Cause code not used at inter-system handover.

NOTE 2: Cause code not applicable to this traffic case.

First Modified Section

4.7.4.1 Assignment

The interworking between the BSSMAP assignment messages in MAP and the RANAP RAB assignment messages is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT REQUEST) BSSMAP information elements: Channel Type	RAB ASSIGNMENT REQ RANAP information elements: RAB parameters	
Positive result	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT COMPLETE or ASSIGNMENT FAILURE) BSSMAP information elements: Cause	RAB ASSIGNMENT RESPONSE (positive result) RAB ASSIGNMENT RESPONSE (negative result) RANAP information elements: Cause	1
Negative result		MAP U/P –ABORT	

~~NOTE: The mapping of the cause codes between BSSMAP and RANAP is for further study.~~

4.7.4.2 Cipher Mode Control

The interworking between the BSSMAP cipher mode messages in MAP and the RANAP security mode messages is as follows:

	29.002	25.413	Notes
Forward message	MAP FORWARD ACCESS SIGN. request -an-APDU(CIPHER MODE CMD)	SECURITY MODE CMD	
	BSSMAP information elements:	RANAP information elements:	
	Encryption information	Integrity protection info Encryption info	
Positive result	MAP PROCESS ACCESS SIGN. request -an-APDU(		
	CIPHER MODE COMPLETE	SECURITY MODE COMPLETE	
	or		
	CIPHER MODE REJECT)	SECURITY MODE REJECT	
	BSSMAP information elements:	RANAP information elements:	
	Encryption information	Integrity protection info Encryption info	
	Cause	Cause	1
Negative result		MAP U/P –ABORT	

~~NOTE: The mapping of the cause codes between BSSMAP and RANAP is for further study.~~

Next New Section

4.7.6 Cause Code Mapping

When a Mobile Station is handed over between GSM and UMTS, a mapping of the cause codes used in the BSSMAP and the RANAP protocols is needed. The mapping described here is applicable to the BSSMAP protocol even when used inside MAP in the E-interface.

The mapping between the cause codes received in BSSMAP Handover Required and the cause codes sent in RANAP Relocation Request is as follows:

08.08	25.413	Notes
HANDOVER REQUIRED	RELOCATION REQUEST	
-Better Cell	-Time critical reloc.	
-Directed retry	-Relocation desired due to radio reasons	
-Distance	-Time critical reloc.	
-Downlink quality	-Time critical reloc.	
-Downlink strength	-Time critical reloc.	
-O and M intervention	-O and M intervention	
-Preemption	-RAB pre-empted	
-Response to MSC invocation	-Time critical reloc.	
-Switch circuit pool		1
-Traffic	-Time critical reloc.	
-Uplink quality	-Time critical reloc.	
-Uplink strength	-Time critical reloc.	
-Any other value	-Time critical reloc.	

NOTE 1: Cause code not used at inter-system handover.

The mapping between the cause codes received in BSSMAP Handover Request and the cause codes sent in RANAP Relocation Request is as follows (the mapping is only used for the MAP-E interface):

08.08	25.413	Notes
HANDOVER REQUEST	RELOCATION REQUEST	
-Better Cell	-Time critical reloc.	
-Directed retry	-Relocation desired due to radio reasons	
-Distance	-Time critical reloc.	
-Downlink quality	-Time critical reloc.	
-Downlink strength	-Time critical reloc.	
-O and M intervention	-O and M intervention	
-Preemption	-RAB pre-empted	
-Response to MSC invocation	-Time critical reloc.	
-Switch circuit pool		1
-Traffic	-Time critical reloc.	
-Uplink quality	-Time critical reloc.	
-Uplink strength	-Time critical reloc.	
-Any other value	-Time critical reloc.	

NOTE 1: Cause code not used at inter-system handover.

The mapping between the cause codes received in BSSMAP Handover Failure and the cause codes sent in RANAP Iu Release Command is as follows:

08.08	25.413	Notes
HANDOVER FAILURE	IU RELEASE COMMAND	
-Ciphering algorithm not supported		2
-Circuit pool mismatch		1
-Equipment failure	-Relocation cancelled	
-Invalid message contents	-Abstract Syntax Error	
-No radio resource available		2
-O and M intervention	-O and M intervention	
-Radio interface failure, reversion to old channel	-Relocation cancelled	
-Radio interface message failure	-Relocation cancelled	
-Requested speech version unavailable		2
-Requested terrestrial resource unavailable		2
-Requested transcoding/rate adaption unavailable		2
-Switch circuit pool		1
-Terrestrial circuit already allocated	-Relocation cancelled	
-Any other value	-Relocation cancelled	

NOTE 1: Cause code not used at inter-system handover.

NOTE 2: Cause code not applicable to this traffic case.

The mapping between the cause codes received in RANAP Relocation Failure and the cause codes sent in BSSMAP Handover Failure is as follows (this mapping is only used for the MAP-E interface):

25.413	08.08	Notes
RELOCATION FAILURE	HANDOVER FAILURE	
-Any value	-No radio resource available	

The mapping between the cause codes received in RANAP Relocation Failure and the cause codes sent in BSSMAP Handover Request Reject is as follows:

25.413	08.08	Notes
RELOCATION FAILURE	HANDOVER ~~REQUEST~~ REQUIRED REJECT	
-Any value	-No radio resource available	

The mapping between the RANAP and the BSSMAP assignment messages is used in the MAP-E interface. RANAP RAB Assignment Response with successful result is mapped to BSSMAP Assignment Complete; RANAP RAB Assignment Response with unsuccessful result is mapped to BSSMAP Assignment Failure ~~(BSSMAP assignment messages do not use BSSMAP cause codes).~~ The mapping between the cause codes received in RANAP RAB Assignment Response and the cause codes sent in BSSMAP Assignment Failure is as follows (this mapping is only used for the MAP-E interface):

25.413	08.08	Notes
RAB ASSIGNMENT RESPONSE	ASSIGNMENT FAILURE	
-Requested traffic class not available	-No radio resource available	
-Invalid RAB parameters value	-Invalid msg. contents	
-Requested max bit rate not available	-No radio resource available	
-Requested max bit rate for DL not available	-No radio resource available	
-Requested max bit rate for UL not available	-No radio resource available	
-Requested guaranteed bit rate not available	-No radio resource available	
-Requested guaranteed bit rate for DL not available	-No radio resource available	
-Requested guaranteed bit rate for UL not available	-No radio resource available	
-Requested transfer delay not achievable	-No radio resource available	
-Invalid RAB param. combination	-Invalid msg. contents	
-Condition violation for SDU parameters	-Invalid msg. contents	
-Condition violation for traffic handling priority	-Invalid msg. contents	
-Condition violation for guaranteed bit rate	-Invalid msg. contents	
-User plane not supported	-No radio resource available	
-Iu UP failure	-Equipment failure	
-Tqueuing expiry	-Radio interface message failure	
-Invalid RAB id	-Invalid msg. contents	
-Request superseeded	-No radio resource available	
-Relocation triggered	-No radio resource available	
-Any other value	-Radio interface message failure	

The mapping between the cause codes received in RANAP Location Report and the cause codes sent in BSSMAP Handover Performed is as follows (this mapping is only used for the MAP-E interface):

25.413	08.08	Notes
LOCATION REPORT	HANDOVER PERFORMED	
-User restriction start ind.	-O&M intervention	
-User restriction start ind.	-O&M intervention	
-Requested report type not supported		1
-Any other value	-Better cell	

NOTE 1: In this case, no Handover Performed is sent.